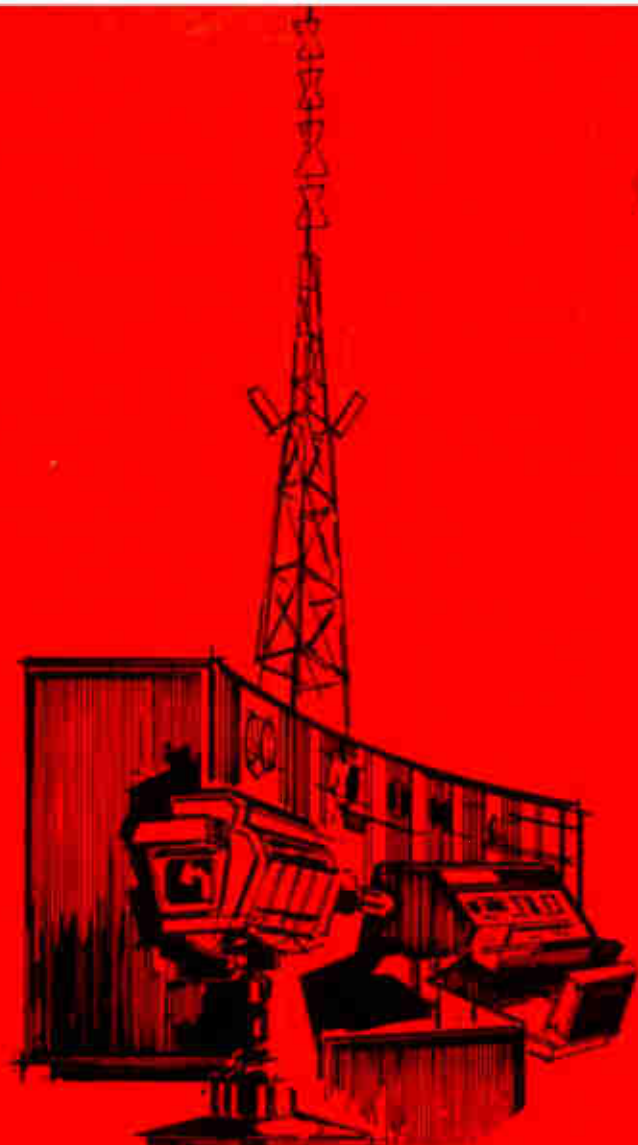


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# The Broadcast Industry

# BUYERS GUIDE

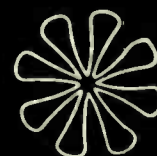
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# BUYERS GUIDE

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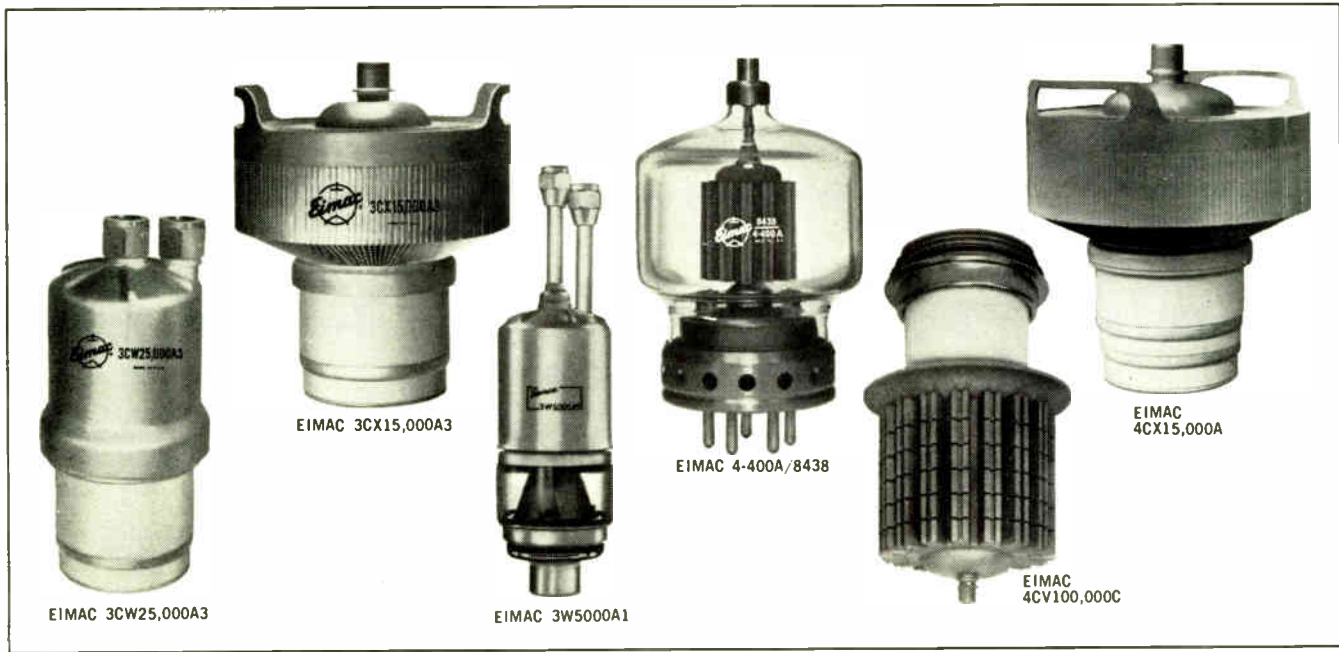
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| Tube Type        | User Price | Socket Type  | Socket Price | Chimney Type | Chimney Price | Tube Type        | User Price | Socket Type                       | Socket Price | Chimney Type | Chimney Price |
|------------------|------------|--------------|--------------|--------------|---------------|------------------|------------|-----------------------------------|--------------|--------------|---------------|
| 2-01C            | \$ 18.00   | None         | \$ ....      | None         | \$ ....       | 3CX20,000A3      | 580.00     | SK-1300                           | 78.50        | None         | ....          |
| 2C39A            | 20.75      | Jettron      | ....         | None         | ....          | 3CX20,000H3      | 580.00     | None                              | ....         | None         | ....          |
| 3CPN10A5/7815    | 30.75      | No. 76-020   | ....         | None         | ....          | 3W5000A1/8240    | 280.00     | (See Note 1)                      | ....         | None         | ....          |
| 3CPX100A5/7815R  | 30.75      | Jettron      | ....         | None         | ....          | 3W5000A3/8242    | 245.00     | (See Note 1)                      | ....         | None         | ....          |
| 3CV30,000A1      | 710.00     | No. 76-020   | ....         | None         | ....          | 3W5000F1/8241    | 260.00     | None                              | ....         | None         | ....          |
| 3CV30,000A3      | 590.00     | SK-1300      | 78.50        | None         | ....          | 3W5000F3/8243    | 250.00     | None                              | ....         | None         | ....          |
| 3CW5000A1        | 280.00     | SK-1300      | 78.50        | None         | ....          | 3X3000A1/8238    | 210.00     | (See Note 1)                      | ....         | None         | ....          |
| 3CW5000A3        | 245.00     | (See Note 1) | ....         | None         | ....          | 3X3000A7         | 255.00     | (See Note 1)                      | ....         | None         | ....          |
| 3CW5000F1        | 260.00     | (See Note 1) | ....         | None         | ....          | 3X3000F1/8239    | 220.00     | None                              | ....         | None         | ....          |
| 3CW5000F3        | 250.00     | None         | ....         | None         | ....          | 3X3000F7/8162    | 260.00     | None                              | ....         | None         | ....          |
| 3CW5000H3        | 240.00     | None         | ....         | None         | ....          | 3-400Z/8163      | 34.00      | SK-410                            | 6.50         | SK-416       | 6.50          |
| 3CW10,000H3      | 356.00     | None         | ....         | None         | ....          | 3-1000Z/8164     | 78.00      | SK-510                            | 6.50         | SK-516       | 12.00         |
| 3CW20,000A1      | 560.00     | SK-1300      | 78.50        | None         | ....          | 4-65A/8165       | 27.00      | E. F. Johnson                     | ....         | None         | ....          |
| 3CW20,000A3      | 455.00     | SK-1300      | 78.50        | None         | ....          | No. 122-101      |            | SK-400                            | 17.50        | SK-406       | 6.50          |
| 3CW20,000A7      | 710.00     | SK-1300      | 78.50        | None         | ....          | 4-125A           | 36.00      | SK-410                            | 6.50         | SK-406       | 6.50          |
| 3CW20,000H3      | 455.00     | None         | ....         | None         | ....          | 4-250A           | 46.50      | SK-400                            | 17.50        | SK-406       | 6.50          |
| 3CW25,000A3      | 480.00     | SK-1300      | 78.50        | None         | ....          | 4-400A/8438      | 48.00      | SK-410                            | 6.50         | SK-406       | 6.50          |
| 3CW30,000H3      | 510.00     | None         | ....         | None         | ....          | 4-1000A/8166     | 131.50     | SK-400                            | 17.50        | SK-406       | 6.50          |
| 3CW40,000H3      | 620.00     | None         | ....         | None         | ....          | 4CPX250K         | 68.50      | SK-410                            | 6.50         | SK-406       | 6.50          |
| 3CW100,000H3     | 2,320.00   | None         | ....         | None         | ....          | 4CS250H          | 69.50      | SK-500                            | 24.30        | SK-506       | 12.00         |
| 3CX100A5/7289    | 26.50      | Jettron      | ....         | None         | ....          | 4CV20,000A       | 470.00     | SK-510                            | 6.50         | SK-506       | 12.00         |
| 3CX100F5/8250    | 34.00      | No. 76-020   | ....         | None         | ....          | 4CV35,000A       | 825.00     | SK-740                            | 10.70        | None         | ....          |
| 3CX1000A7/8283   | 250.00     | Jettron      | ....         | None         | ....          | 4CV100,000C/8351 | 2,350.00   | (See Note 2)                      | ....         | None         | ....          |
| 3CX2500A3        | 200.00     | No. 76-020   | ....         | None         | ....          | 4CW800A          | 331.00     | SK-800B                           | 54.00        | SK-806       | 8.50          |
| 3CX2500F3        | 205.00     | SK-860       | 38.00        | SK-816       | 7.00          | 4CW2000A/8244    | 220.00     | SK-810B                           | 56.00        | SK-806       | 8.50          |
| 3CX2500H3        | 240.00     | SK-870       | 40.00        | SK-816       | 7.00          | 4CW10,000A       | 610.00     | SK-890B                           | 65.00        | SK-806       | 8.50          |
| 3CX3000A1        | 210.00     | (See Note 1) | ....         | None         | ....          | 4CW25,000A       | 825.00     | SK-300                            | 103.00       | SK-306       | 6.50          |
| 3CX3000A7        | 255.00     | (See Note 1) | ....         | None         | ....          | 4CW50,000C/8350  | 2,100.00   | SK-300A                           | 103.00       | SK-316       | 9.65          |
| 3CX3000F1        | 220.00     | (See Note 1) | ....         | None         | ....          | 4CW100,000D      | 2,100.00   | SK-300                            | 103.00       | SK-306       | 6.50          |
| 3CX3000F7        | 260.00     | None         | ....         | None         | ....          | 4CX250B/7203     | 35.60      | SK-300A                           | 103.00       | SK-316       | 9.65          |
| 3CX5000A3        | 356.00     | SK-1300      | 78.50        | None         | ....          | 4CX250F/7204     | 38.00      | SK-1500                           | 220.00       | None         | ....          |
| 3CX5000H3        | 356.00     | None         | ....         | None         | ....          | 4CX250K/8245     | 64.00      | SK-1500                           | 220.00       | None         | ....          |
| 3CX10,000A1/8158 | 490.00     | None         | ....         | None         | ....          | 4CX250R/7580W    | 44.50      | SK-1510                           | 250.00       | None         | ....          |
| 3CX10,000A3/8159 | 490.00     | SK-1300      | 78.50        | SK-1306      | 6.50          | 4CX300A/8167     | 54.00      | *See SK-600 Series Socket Listing | ....         | None         | ....          |
| 3CX10,000A7/8160 | 530.00     | SK-1300      | 78.50        | SK-1306      | 6.50          | 4CX300Y          | 105.00     | *See SK-600 Series Socket Listing | ....         | None         | ....          |
| 3CX10,000H3      | 455.00     | None         | ....         | None         | ....          | 4CX350A/8321     | 48.50      | *See 4CX125C Socket Listing       | ....         | None         | ....          |
| 3CX15,000A3      | 510.00     | SK-1300      | 78.50        | None         | ....          | 4CX350F/8322     | 51.50      | *See SK-600 Series Socket Listing | ....         | None         | ....          |
| 3CX15,000H3      | 510.00     | None         | ....         | None         | ....          | 4CX600A          | 319.00     | *See SK-600 Series Socket Listing | ....         | None         | ....          |
|                  |            |              |              |              |               | 4CX1000A/8168    | 181.00     | SK-800B                           | 54.00        | SK-806       | 8.50          |
|                  |            |              |              |              |               | 4CX1000K/8352    | 193.00     | SK-810B                           | 56.00        | SK-806       | 8.50          |
|                  |            |              |              |              |               |                  |            | SK-890B                           | 65.00        | SK-806       | 8.50          |
|                  |            |              |              |              |               |                  |            | SK-820                            | 140.00       | SK-806       | 8.50          |
|                  |            |              |              |              |               |                  |            | SK-830                            | 178.00       | SK-806       | 8.50          |

Note (1): None, but the following colls are available from EIMAC: 149575 (innerline filament collet); 149576 (outer line filament collet)  
 Note (2): None, but the following colls are available from EIMAC: 008290 (heater pin connection); 008291 (cathode collet); 008292 (control grid collet); 008294 (anode collet); 882931 (screen grid collet)



| Tube Type        | User Price | Socket Type                         | Socket Price | Chimney Type | Chimney Price | Tube Type                     | User Price  | Socket Type                        | Socket Price        | Chimney Type         | Chimney Price |       |
|------------------|------------|-------------------------------------|--------------|--------------|---------------|-------------------------------|---|------------------------------------|---------------------|----------------------|---------------|-------|
| 4CX1500B/8660    | 205.00     | *See 4CX1000A Series Socket Listing |              |              |               |                               | 8166/4-1000A  | 131.50                             | SK-500              | 24.30                | SK-506        | 12.00 |
| 4CX3000A/8169    | 420.00     | SK-1400A                            | 107.00       | SK-1406      | 6.50          |                               |   | SK-510                             | 6.50                | SK-506               | 12.00         |       |
|                  |            | SK-1470A                            | 107.00       | SK-1406      | 6.50          | 8167/4CX300A                  | 54.00   | *See 4CX125C Series Socket Listing |                     |                      |               |       |
| 4CX5000A/8170    | 495.00     | SK-300                              | 103.00       | SK-306       | 6.50          | 8168/4CX1000A                 | 181.00  | SK-800B                            | 54.00               | SK-806               | 8.50          |       |
|                  |            | SK-300A                             | 103.00       | SK-316       | 9.65          |                               |   | SK-810B                            | 56.00               | SK-806               | 8.50          |       |
| 4CX5000R/8170W   | 705.00     | SK-300                              | 103.00       | SK-306       | 6.50          |                               |   | SK-890B                            | 65.00               | SK-806               | 8.50          |       |
|                  |            | SK-300A                             | 103.00       | SK-316       | 9.65          | 8169/4CX3000A                 | 420.00  | SK-1400A                           | 107.00              | SK-1406              | 6.50          |       |
| 4CX10,000D/8171  | 550.00     | SK-300                              | 103.00       | SK-306       | 6.50          |                               |   | SK-1470A                           | 107.00              | SK-1406              | 6.50          |       |
|                  |            | SK-300A                             | 103.00       | SK-316       | 9.65          | 8170W/4CX5000R                | 705.00  | SK-300                             | 103.00              | SK-306               | 6.50          |       |
| 4CX15,000A/8281  | 695.00     | SK-300                              | 103.00       | SK-306       | 6.50          |                               |   |                                    |                     | SK-316               | 9.65          |       |
|                  |            | SK-300A                             | 103.00       | SK-316       | 9.65          | 8171/4CX10,000D               | 550.00  | SK-300                             | 103.00              | SK-306               | 6.50          |       |
|                  |            |                                     |              | SK-1306      | 6.50          |                               |   |                                    |                     | SK-316               | 9.65          |       |
| 4CX35,000C/8349  | 1,765.00   | SK-1500                             | 220.00       | None         | .....         | 8172/4X150G                   | 58.00   | None                               | .....               | None                 | .....         |       |
|                  |            | SK-1510                             | 250.00       | None         | .....         | 8173/4W20,000A                | 2,030.00  | None                               | .....               | None                 | .....         |       |
| 4E27A/5-125B     | 45.00      | E. F. Johnson                       | .....        | None         | .....         | 8238/3X3000A1                 | 210.00  | None                               | .....               | None                 | .....         |       |
|                  |            | No. 122-237                         | .....        | None         | .....         | 8239/3X3000F1                 | 220.00  | None                               | .....               | None                 | .....         |       |
| 4W20,000A/8173   | 2,030.00   | None                                | .....        | None         | .....         | 8240/3W5000A1                 | 280.00  | None                               | .....               | None                 | .....         |       |
| 4X150A/7034      | 23.15      | *See SK-600 Series Socket Listing   |              |              |               |                               | 8241/3W5000F1   | 260.00                             | None                | .....                | None          | ..... |
| 4X150D/7035      | 29.00      | *See SK-600 Series Socket Listing   |              |              |               |                               | 8242/3W5000A3   | 245.00                             | None                | .....                | None          | ..... |
| 4X150G/8172      | 58.00      | None                                | .....        | None         | .....         | 8243/3W5000F3                 | 250.00  | None                               | .....               | None                 | .....         |       |
| 4X250B           | 35.60      | *See SK-600 Series Socket Listing   |              |              |               |                               | 8244/4CW2000A   | 220.00                             | SK-800B             | 54.00                | None          | ..... |
| 4X250F           | 35.60      | *See SK-600 Series Socket Listing   |              |              |               |                               |   |                                    | SK-810B             | 56.00                | None          | ..... |
| 4X500A           | 127.50     | SK-900                              | 68.50        | SK-906       | 15.00         | 8245/4CX250K                  | 64.00   | SK-890B                            | 65.00               | None                 | .....         |       |
| 5-500A           | 58.50      | SK-400                              | 17.50        | None         | .....         | 8250/3CX100F5                 | 34.00   | None                               | .....               | None                 | .....         |       |
|                  |            | SK-410                              | 6.50         | None         | .....         |                               |   | Jettron                            | .....               | None                 | .....         |       |
| 5CX1500A         | 218.00     | SK-840                              | 61.25        | SK-806       | 8.50          | 8281/4CX15,000A               | 695.00  | No. 76-020                         | .....               | SK-306               | 6.50          |       |
| 5CX3000A         | 437.00     | Y-386                               | 114.00       | None         | .....         |                               |   | SK-300A                            | 103.00              | SK-316               | 9.65          |       |
| 304TH            | 83.00      | E. F. Johnson                       | .....        | None         | .....         |                               |   |                                    |                     | SK-1306              | 6.50          |       |
|                  |            | No. 124-213                         | .....        | None         | .....         | 8283/3CX1000A7                | 250.00  | SK-860                             | 38.00               | SK-816               | 7.00          |       |
| 304TL            | 83.00      | E. F. Johnson                       | .....        | None         | .....         |                               |   | SK-870                             | 40.00               | SK-816               | 7.00          |       |
|                  |            | No. 124-213                         | .....        | None         | .....         | 8321/4CX350A                  | 48.50   | *See SK-600 Series Socket Listing  |                     |                      |               |       |
| 450TH            | 85.00      | E. F. Johnson                       | .....        | None         | .....         | 8322/4CX350F                  | 51.50   | *See SK-600 Series Socket Listing  |                     |                      |               |       |
|                  |            | No. 123-211                         | .....        | None         | .....         | 8349/4CX35,000C               | 1,765.00  | SK-1500                            | 220.00              | None                 | .....         |       |
| 450TL            | 85.00      | E. F. Johnson                       | .....        | None         | .....         | 8350/4CW50,000C               | 2,100.00  | SK-1500                            | 220.00              | None                 | .....         |       |
|                  |            | No. 123-211                         | .....        | None         | .....         | 8351/4CX100,000C              | 2,350.00  | SK-1510                            | 250.00              | None                 | .....         |       |
| 575A             | 20.15      | E. F. Johnson                       | .....        | None         | .....         | 8352/4CX1000K                 | 193.00  | SK-820                             | 140.00              | SK-806               | 8.50          |       |
|                  |            | No. 123-211                         | .....        | None         | .....         |                               |   | SK-830                             | 178.00              | SK-806               | 8.50          |       |
| 592/3-200A3      | 55.00      | None                                | .....        | None         | .....         | 8438/4-400A                   | 48.00   | SK-400                             | 17.50               | SK-406               | 6.50          |       |
| 673              | 20.15      | E. F. Johnson                       | .....        | None         | .....         |                               |   | SK-410                             | 6.50                | SK-406               | 6.50          |       |
|                  |            | No. 123-206                         | .....        | None         | .....         | 8561/4CX300Y                  | 105.00  | SK-711A                            | 25.70               | SK-606               | 0.75          |       |
| 750TL            | 224.00     | E. F. Johnson                       | .....        | None         | .....         |                               |   | SK-760                             | 10.70               | None                 | .....         |       |
|                  |            | No. 124-214                         | .....        | None         | .....         | 8660/4CX1500B                 | 205.00  | SK-770                             | 10.70               | None                 | .....         |       |
| 869B             | 138.00     | None                                | .....        | None         | .....         |                               |   | SK-800B                            | 54.00               | SK-806               | 8.50          |       |
| 869B/L           | 138.00     | None                                | .....        | None         | .....         |                               |   | SK-810B                            | 56.00               | SK-806               | 8.50          |       |
| 5867A            | 30.60      | SK-410                              | 6.50         | SK-406       | 6.50          | KY21A                         | 33.80   | E. F. Johnson                      | .....               | None                 | .....         |       |
| 6155             | 36.00      | SK-410                              | 6.50         | SK-406       | 6.50          |                               |   | No. 122-225                        | .....               | None                 | .....         |       |
| 6156             | 42.00      | SK-410                              | 6.50         | SK-406       | 6.50          | RX21A                         | 32.80   | E. F. Johnson                      | .....               | None                 | .....         |       |
| 6696A            | 1,105.00   | None                                | .....        | None         | .....         |                               |   | No. 122-225                        | .....               | None                 | .....         |       |
| 6697A            | 1,330.00   | None                                | .....        | None         | .....         | *SK-600 Series Socket Listing |   |                                    |                     |                      |               |       |
| 7034/4X150A      | 23.15      | *See SK-600 Series Socket Listing   |              |              |               |                               | For the following tubes, use the socket and chimney schedule shown below: |                                    |                     |                      |               |       |
| 7035/4X150D      | 29.00      | *See SK-600 Series Socket Listing   |              |              |               |                               |   |                                    |                     |                      |               |       |
| 7203/4CX250B     | 35.60      | *See SK-600 Series Socket Listing   |              |              |               |                               |   |                                    |                     |                      |               |       |
| 7204/4CX250F     | 35.60      | *See SK-600 Series Socket Listing   |              |              |               |                               |   |                                    |                     |                      |               |       |
| 7211             | 88.50      | Jettron                             | .....        | None         | .....         |                               |   |                                    |                     |                      |               |       |
|                  |            | No. 76-020                          | .....        | None         | .....         | <b>Tubes</b>                  | <b>Socket Type</b>  | <b>Socket Price</b>                | <b>Chimney Type</b> | <b>Chimney Price</b> |               |       |
| 7257             | 45.00      | SK-410                              | 6.50         | None         | .....         | 4X150A/7034                   |   |                                    |                     |                      |               |       |
| 7289/3CX100A5    | 26.50      | Jettron                             | .....        | None         | .....         | 4X150D/7035                   |   |                                    |                     |                      |               |       |
|                  |            | No. 76-020                          | .....        | None         | .....         | 4X250B                        | SK-600  | 11.25                              | SK-606              | 0.75                 |               |       |
| 7480             | 1,590.00   | None                                | .....        | None         | .....         | 4X250F                        | SK-600A   | 11.25                              | SK-606              | 0.75                 |               |       |
| 7580W/4CX250R    | 44.50      | *See SK-600 Series Socket Listing   |              |              |               |                               | 4CX250B/7203  | SK-610                             | 11.25               | SK-606               | 0.75          |       |
| 7698             | 88.50      | Jettron                             | .....        | None         | .....         | 4CX250F/7204                  | SK-620  | 12.00                              | SK-606              | 0.75                 |               |       |
|                  |            | No. 76-020                          | .....        | None         | .....         | 4CX250R/7580W                 |   |                                    |                     |                      |               |       |
| 7815/3CPN10A5    | 30.75      | Jettron                             | .....        | None         | .....         | 4CX350A/8321                  | SK-620A   | 15.00                              | SK-636B             | 11.00                |               |       |
| 7815R/3CPX100A5  | 30.75      | Jettron                             | .....        | None         | .....         | 4CX350F/8322                  |   |                                    | SK-626              | 0.75                 |               |       |
|                  |            | No. 76-020                          | .....        | None         | .....         | 7203/4CX250B                  |   |                                    | SK-636B             | 11.00                |               |       |
| 7843             | 51.00      | None                                | .....        | None         | .....         | 7204/4CX250F                  | SK-630A   | 15.00                              | SK-626              | 0.75                 |               |       |
| 8158/3CX10,000A1 | 490.00     | SK-1300                             | 78.50        | SK-1306      | 6.50          | 7580W/4CX250R                 |   |                                    | SK-636B             | 11.00                |               |       |
| 8159/3CX10,000A3 | 490.00     | SK-1300                             | 78.50        | SK-1306      | 6.50          | 8321/4CX350A                  | SK-640  | 6.90                               | SK-606              | 0.75                 |               |       |
| 8160/3CX10,000A7 | 530.00     | SK-1300                             | 78.50        | SK-1306      | 6.50          | 8322/4CX350F                  | SK-650  | 8.50                               | None                | .....                |               |       |
| 8163/3-400Z      | 34.00      | SK-410                              | 6.50         | SK-416       | 6.50          | 7034/4X150A                   |   |                                    |                     |                      |               |       |
| 8164/3-1000Z     | 78.00      | SK-510                              | 6.50         | SK-516       | 12.00         | 7035/4X150D                   |   |                                    |                     |                      |               |       |
| 8165/4-65A       | 27.00      | E. F. Johnson                       | .....        | None         | .....         |                               |   |                                    |                     |                      |               |       |
|                  |            | No. 122-101                         | .....        | None         | .....         |                               |   |                                    |                     |                      |               |       |

Prices subject to change without notice. Write for complete specifications on any tube to Power Grid Tube Marketing.



**EIMAC**  
Division of Varian  
San Carlos, California 94070



# MEMO

TO: General Manager  
FROM: Director of Engineering

Like for you to look over this Computer-Programmer. I've been checking into what's available and this looks like the one for us, for several reasons:

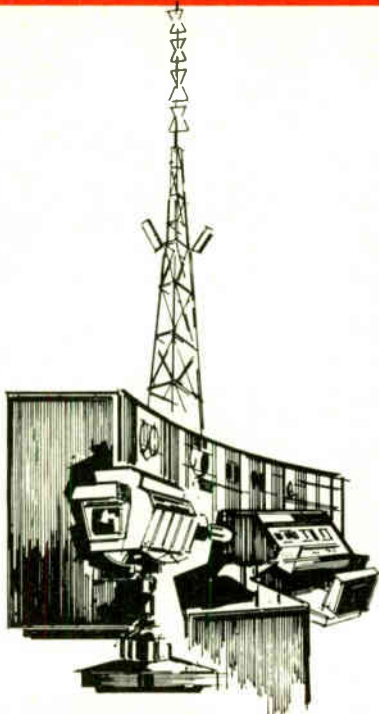
1. It's a pretty sophisticated system. We could integrate our entire studio operation—master control switching, studio switching, audio functions, machine controls—the whole works.

2. All the peripheral equipment—machine control interfaces, video and audio switching gear, etc.—comes with it.

3. Most important—it works! It's made by Sarkes Tarzian, Inc. in Bloomington, Ind. They're the only ones I've found with actual computer experience in broadcasting—in both large and small stations. This 4th generation model of theirs has all the bugs worked out. Looks like they meet our basic criteria: they've got the experience, the equipment, and they've applied both.

What do you think?





# PRODUCT DIRECTORY

The listings in this section have been compiled from questionnaires completed by manufacturers and service organizations across the nation. It contains over 650 major product classifications. For a specific manufacturer, see Guide to Manufacturers.

## ACOUSTIC MATERIALS

ATLAS SOUND  
HARTLEY PRODUCTS  
ROBINS INDUSTRIES CORP.  
SINGER PRODUCTS CO.

## ADAPTERS, CONNECTOR

AMECO, INC.  
AMERICAN CABLE ELECTRONICS  
AMPHENOL DISTRIBUTOR DIVISION  
APPLIED ELECTRO-MECHANICS  
ATLAS SOUND  
BIRNS & SAWYER  
BLONDRÉ-TONGUE LABORATORIES  
G C ELECTRONICS COMPANY  
GENERAL RADIO CO  
HEWLETT-PACKARD CO.  
IMPEX ELECTRONICS CORP  
JERROLD ELECTRONICS CORP  
MICROWAVE ASSOCIATES, INC.  
PRODELIN, INCORPORATED  
ROBINS INDUSTRIES CORP.  
SWITCHCRAFT, INC.  
THE TECHNICAL MATERIAL CORP  
TROMPETER ELECTRONICS

## ADAPTERS, FM STEREO

CALBEST ELECTRONICS  
G C ELECTRONICS COMPANY  
HEATH CO  
IMPEX ELECTRONICS CORP  
KARG LABORATORIES  
MCMARTIN INDUSTRIES  
SINGER PRODUCTS CO

## ADAPTERS, TEST

AMECO, INC.  
RIRNBACH CO  
DELTA ELECTRONICS, INC.  
G C ELECTRONICS COMPANY  
HEWLETT-PACKARD CO.  
JERROLD ELECTRONICS CORP  
MICROLAB / FXR

## ADAPTERS, TUBE

EIMAC DIVISION OF VARIAN

## ALARM, FAULT

BIOTIC INSTRUMENTS, INC.  
BIRD ELECTRONIC CORPORATION  
HOUSTON ELECTRONICS CO.  
HUGHES & PHILLIPS  
JERROLD ELECTRONICS CORP  
MALLORY DISTRIBUTOR PRODUCTS  
MOSELEY ASSOCIATES, INC.  
SINGER PRODUCTS CO.  
SPENCER-KENNEDY LABORATORIES  
TREPAC CORPORATION OF AMERICA

## ALARM, INTRUDER

BIOTIC INSTRUMENTS, INC.  
ELECTRONICS ESSENTIALS OF CCC  
THE JAMES FLOYD FORD CO

HOUSTON ELECTRONICS CO.

## ALARM, SIGNAL

BIOTIC INSTRUMENTS, INC.  
DELTA ELECTRONICS, INC.  
THE JAMES FLOYD FORD CO  
MINNESOTA MINING - 3 M  
SINGER PRODUCTS CO.  
TREPAC CORPORATION OF AMERICA

## AMMETERS, AC

ALLIED ELECTRONICS CORP  
API INSTRUMENTS CO.  
COLUMBIA ELECTRIC MFG CO  
G E INDUSTRIAL SALES OPERATION  
GENERAL ELECTRIC CO  
HEWLETT-PACKARD CO.  
HICKOK ELECTRICAL INSTRUMENT  
INSTRUMENT LABORATORIES CORP  
THE SINGER CO - METRICS DIV  
TRIPLETT ELECTRICAL INSTRUMENT  
YOKOGAWA ELECTRIC WORKS

## AMMETERS, AC, THERMOCOUPLE

API INSTRUMENTS CO.  
G E INDUSTRIAL SALES OPERATION  
THE SINGER CO - METRICS DIV  
TRIPLETT ELECTRICAL INSTRUMENT  
YOKOGAWA ELECTRIC WORKS

## AMMETERS, DC

ALLIED ELECTRONICS CHRP  
API INSTRUMENTS CO.  
COMU ELECTRONICS  
COLUMBIA ELECTRIC MFG CO  
G E INDUSTRIAL SALES OPERATION  
GENERAL ELECTRIC CO  
HEWLETT-PACKARD CO.  
HICKOK ELECTRICAL INSTRUMENT  
INSTRUMENT LABORATORIES CORP  
THE SINGER CO - METRICS DIV  
TRIPLETT ELECTRICAL INSTRUMENT  
YOKOGAWA ELECTRIC WORKS

## AMMETERS, RF

G E INDUSTRIAL SALES OPERATION  
HEWLETT-PACKARD CO.  
THE SINGER CO - METRICS DIV  
TELESIS CORPORATION  
TELETRONIX  
TRIPLETT ELECTRICAL INSTRUMENT  
YOKOGAWA ELECTRIC WORKS

## AMPLIFIER, AF, AGC

ALTEC LANSING  
AMECO, INC.  
AMPLIFIER CORP OF AMERICA  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
CENTRAL DYNAMICS CORPORATION  
ELECTRONIC SYSTEM ENGINEERING  
GATES RADIO COMPANY  
MARTI ELECTRONICS

MELCOR ELECTRONICS  
RCA BROADCAST PRODS.  
ROUND HILL ASSOCIATES  
SINGER PRODUCTS CO.  
STEPHENS ELECTRONICS  
TELETRONIX  
VISUAL ELECTRONICS CORP  
WARD ELECTRONIC INDUSTRIES  
WILKINSON ELECTRONICS, INC

## AMPLIFIER, AF, COMPRESSING

ALTEC LANSING  
AMPLIFIER CORP OF AMERICA  
BAUER ELECTRONICS CORPORATION  
C R S LABORATORIES  
CCA ELECTRONICS CORPORATION  
CENTRAL DYNAMICS CORPORATION  
COLLINS RADIO COMPANY  
ELECTRONIC SYSTEM ENGINEERING  
GATES RADIO COMPANY  
MARTI ELECTRONICS  
MELCOR ELECTRONICS  
ORBIT RADIO  
RCA BROADCAST PRODS.  
ROUND HILL ASSOCIATES  
SINGER PRODUCTS CO.  
SOUTHWESTERN COMMUNICATIONS  
STANCIŁ-HOFFMAN CORPORATION  
STEPHENS ELECTRONICS  
TELETRONIX  
TREPAC CORPORATION OF AMERICA  
VEGA ELECTRONICS CORPORATION  
VISUAL ELECTRONICS CORP  
WARD ELECTRONIC INDUSTRIES

## AMPLIFIER, AF, GENERAL PURPOSE

ALMA ENGINEERING INC  
ALTEC LANSING  
AMPLIFIER CORP OF AMERICA  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
CENTRAL DYNAMICS CORPORATION  
CENTURY PROJECTOR CORPORATION  
CROWN INTERNATIONAL  
DAYTON ELECTRONIC PRODUCTS CO  
DELTA ELECTRONICS, INC.  
ELECTRO-VOICE INC  
ELECTRONICS ESSENTIALS OF CCC  
FAIRCHILD RECORDING EQUIPMENT  
FISHER BERKELEY CORPORATION  
GATES RADIO COMPANY  
G F VISUAL COMMUNICATION, PROD  
GENERAL RADIO CO  
INTERNATIONAL GOOD MUSIC  
LANG ELECTRONICS, INC  
LANGVIN  
MARANTZ COMPANY  
MARTI ELECTRONICS  
MCMARTIN INDUSTRIES  
MELCOR ELECTRONICS  
MID AMERICA ELECTRONICS CORP

MULTRONICS  
NORTH AMERICAN PHILIPS CO  
ORBIT RADIO  
PERMOFLUX CORPORATION  
RCA BROADCAST PRODS.  
ROUND HILL ASSOCIATES  
H. H. SCOTT, INCORPORATED  
SCULLY RECORDING INSTRUMENTS  
SOUNDRAFT INDUSTRIES  
SOUTHWESTERN COMMUNICATIONS  
STANCIŁ-HOFFMAN CORPORATION  
STEPHENS ELECTRONICS  
TELETRONIX  
TREPAC CORPORATION OF AMERICA  
VISUAL ELECTRONICS CORP  
WARD ELECTRONIC INDUSTRIES

## AMPLIFIER, AF, MONAURAL

ALMA ENGINEERING INC  
ALTEC LANSING  
BAUER ELECTRONICS CORPORATION  
BROWNING LABORATORIES, INC.  
CCA ELECTRONICS CORPORATION  
CENTRAL DYNAMICS CORPORATION  
CROWN INTERNATIONAL  
DAYTON ELECTRONIC PRODUCTS CO  
ELECTRO-SOUND ACOUSTICS  
ELECTRONICS ESSENTIALS OF CCC  
GATES RADIO COMPANY  
G F VISUAL COMMUNICATIONS PROD  
GREGORY AMPLIFIER CORP  
JERROLD INDUSTRIES, INC.  
JOHNSON ELECTRONICS, INC.  
LANGVIN  
MAGNECOR  
MARANTZ COMPANY  
MCMARTIN INDUSTRIES  
MELCOR ELECTRONICS  
ORBIT RADIO  
PERMOFLUX CORPORATION  
RCA BROADCAST PRODS.  
RECORDING EQUIPMENT COMPANY  
ROUND HILL ASSOCIATES  
RUSSCO ELECTRONICS MFG.  
H. H. SCOTT, INCORPORATED  
SCULLY RECORDING INSTRUMENTS  
SOUTHWESTERN COMMUNICATIONS  
STANCIŁ-HOFFMAN CORPORATION  
STEPHENS ELECTRONICS  
TELETRONIX  
VIKING OF MINNEAPOLIS  
VISUAL ELECTRONICS CORP  
WILKINSON ELECTRONICS, INC

## AMPLIFIER, AF, PEAK LIMITING, AM

ALTEC LANSING  
BAUER ELECTRONICS CORPORATION  
C R S LABORATORIES  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
FAIRCHILD RECORDING EQUIPMENT

# We'll do a m for you free!

Great solid-state profit-boosters! They let you realize the full potential of your transmitter. And any one or all will work for 30 days free! If they haven't proved their worth by then, ship them back. We'll even pay the freight.

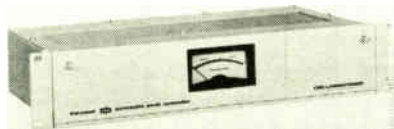
30 day trial offer limited to U.S.A. only.

Audimax is an automatic level control guaranteed to outperform ordinary compressors, limiters or AGCs. It can increase effective program power up to 4:1.

Volumax is an automatic peak controller that overcomes the inherent limitations of peak limiters. Its microsecond regulation virtually doubles the efficiency of Audimax. Result: a combined increase in effective program power of up to 8:1.

The FM Volumax is a totally new concept in automatic peak control that solves FM overmodulation problems created by pre-emphasized audio signals. It offers positive prevention of FM overmodulation and SCA crosstalk without distortion.

**Audimax thinks smart.** Its solid state logic circuitry monitors incoming signal and compares it with its memory of average program content over a preceding period of time. This gives

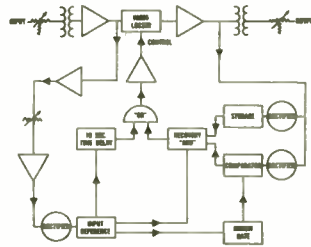


Audimax the ability to adapt to changing program gain situations and react in the same way a human engineer would.

Its remarkable Gated Gain Stabilizer enables Audimax to maintain constant gain during prolonged program pauses. It eliminates the fade-out of background effects or "swish-up" of background noise.

A special Return-to-Zero function

operates when standby conditions occur. Audimax waits about 10 seconds, keeping gain steady at the last correct setting.



When its memory is convinced that the program has ended, it slowly returns to normal gain. Background effects are held at natural levels, and proper level is assured upon resumption of program.

Audimax boosts overall average levels while automating control functions. Average modulation can be increased by 6 dB, which represents a 300% increase in radiated program power. Specifications: Audimax III, Mod. 444, \$665. Frequency Response, flat within 1 dB, from 50 to 15,000 cps; Harmonic Distortion, less than 1% from 50 to 15,000 cps at +16 dBm output; Noise Level, below -60 dBm at normal gain; Control Characteristic,  $\pm 10$  dB of gain control; Gated Gain Stabilizer, threshold adjustable from -24 dB to normal output; Return-to-Zero Function, returns gain to normal during pauses greater than 10 seconds; Maximum Gain, 50 dB; Input and Output Impedance, 600 ohms, balanced or unbalanced (150 ohms optional); Normal Output Level, +11 VU; Maximum Output, +25 dBm; Minimum Input Level, -30 VU; Physical Dimensions, standard 19" rack mounting, 3 1/2" high, 9 3/8" deep; Power Requirements, 15 watts at 115/230 volts AC, 50/60 cps; Shipping Weight, 17 lbs.; Audimax III S,

Model 445, specially coupled for Stereophonic Operation, \$1390.

**Volumax makes each watt work harder.** The only similarity between Volumax and conventional peak limiters is that it also prevents overmodulation by instantaneous program peaks. But with conventional limiters, program level must be reduced so that limiting of peaks won't cause drastic distortion and "pumping". Conventional limiters usually moderate pumping by using long recovery times. Thus, in intervals immediately following high peaks, valuable modulation capability is wasted as limiter recovers from reduced gain.

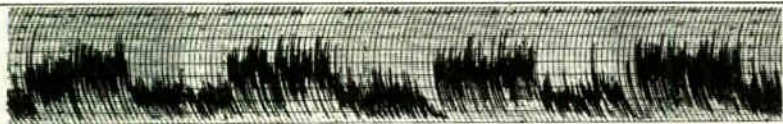


Volumax, however, analyzes all program material, automatically chooses the most appropriate regulation speed and limiting action is gentle or micro-second fast, depending on the nature of the program waveform. Result: a more even, pleasant sound that can be safely transmitted at twice the program power usually expected with conventional limiters.

While Audimax controls average program levels, Volumax precisely controls transmitter modulation. Used together, they can raise effective program power by factor of nearly 8:1.

Bonus for AM Broadcasters: Since Volumax can be operated asymmetrically at the user's option, limiting levels for negative peaks may be kept below the 100% modulation level, while positive peaks may be allowed to exceed 100%, thus boosting effective coverage still further.

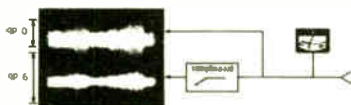
# onth's work



Under carefully controlled test conditions, the performance of a Valumax was compared with a popular conventional peak limiter by a non-CBS affiliated broadcasting network. Both devices were adjusted for comparable limiting and peak output resulting in 100% modulation. At five-minute intervals the two units were alternately switched into the transmission circuit and the off-the-air demodulated signals were compared in a monitoring receiver. The above chart of a recording VU meter shows the results. Valumax provided nearly twice the modulation level of the conventional limiter.

**Specifications: Valumax, Mod. 400, \$665.** Input and Output Impedance, 600 ohms, balanced or unbalanced; Input Level, -24 to +8 dBm; Maximum Output Level, controlled peaks +21 dBm; noncontrolled peaks +25 dBm; Maximum Gain, 50 dB; Noise Level, below -70 dB re +21 dBm output; Frequency Response, flat within 1 dB, 50 to 15,000 cps throughout normal control range; Attack Time, less than 1 microsecond or 2 milliseconds, depending on program waveform; Recovery Time, 140 milliseconds; Maximum Operating Temperature, 55° C; Power Requirements, 15 watts at 115/230 volts AC, 50/60 cps; Physical Dimensions, fits standard 19" rack, 3½" high, 9⅝" deep; Shipping Weight, 17 lbs.

**FM Volumax now solves the classic FM pre-emphasis dilemma.** Musical effects such as cymbal crashes can easily cause overmodulation up to 300%.



(Diagram and oscilloscope photos show audio peak levels of cymbal crash with and without pre-emphasis.) To transmit such a signal safely, an FM broadcaster would have to reduce his low frequency

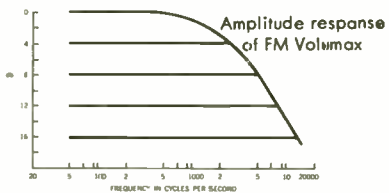
modulation level to approximately 35% and operate with less than ⅛ of his authorized maximum program power. Various methods of control have been tried from time to time. Limiting before pre-emphasis, controls low frequencies but doesn't permit much increase in program levels. Limiting after pre-emphasis, controls overmodulation, but often means severe pumping and sudden losses in level. Clipping after pre-emphasis, removes only offending peaks, and creates new problems of serious distortion.



**Solution:** the new FM Volumax works like a recording-session engineer who moves certain instruments away from the microphones and requires others to play softer. It uses time-varying functions to control low and high frequency amplitudes separately, and instantaneous final limiting to prevent overmodulation. A new method of dynamic frequency compensation adjusts high frequency levels and processes all frequencies at reference level, without distortion.

Amplitude response of FM Volumax. At low levels, frequency response is flat over

entire range. At maximum levels, response is the inverse of the pre-emphasis slope. Thus, maximum output is always precisely equal to the 100% modulation level, after transmitter pre-emphasis.



**Specifications: FM Volumax, Mod. 410, \$695.** Input and Output Impedance, 600 ohms, balanced or unbalanced (150 ohms optional); Input Level, -24 to +8 dBm; Maximum Peak Output Level, +21 dBm; Maximum Gain, 50 dB; Noise Level, below -70 dB re +21 dBm output; Frequency Response, flat within 1 dB, 50 to 15,000 cps, 20 dB below maximum level; 75 microsecond slope at maximum; 50 microsecond or other contours possible with simple field modification; Harmonic Distortion, less than 1% from 50 to 15,000 cps throughout entire control range; Attack Time, less than one microsecond or 2 milliseconds depending on program waveform; Recovery Time, 140 milliseconds (low frequencies), 10 milliseconds (high frequencies); Maximum Operating Temperature, 55° C; Power Requirements, 15 watts, at 115/230 Volts AC, 50/60 cps; Physical Dimensions, standard 19" rack, 3½" high, 9⅝" deep; Shipping Weight, 18 lbs.; **FM Volumax, Model 411, specially coupled for Stereophonic Operation, \$1390.**

All prices F.O.B. Stamford, Connecticut.

**CBS LABORATORIES**  
Stamford, Connecticut. A Division of  
Columbia Broadcasting System, Inc.

GATES RADIO COMPANY  
G E VISUAL COMMUNICATIONS PROO  
KAHN RESEARCH LABORATORIES  
RCA BROADCAST PROOS.  
ROUND HILL ASSOCIATES  
SINGER PRODUCTS CO.  
SOUTHWESTERN COMMUNICATIONS  
TELETRONIX  
VISUAL ELECTRONICS CORP  
WARD ELECTRONIC INDUSTRIES  
WILKINSON ELECTRONICS, INC

AMPLIFIER, AF,

PEAK LIMITING, FM  
PEAK LIMITING, FM  
BAUER ELECTRONICS CORPORATION  
C B S LABORATORIES  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
FAIRCHILD RECORDING EQUIPMENT  
GATES RADIO COMPANY  
G E VISUAL COMMUNICATIONS PROO  
ROUND HILL ASSOCIATES  
SINGER PRODUCTS CO.  
SOUTHWESTERN COMMUNICATIONS  
TELETRONIX  
VISUAL ELECTRONICS CORP  
WILKINSON ELECTRONICS, INC

AMPLIFIER, AF, REMOTE

ALMA ENGINEERING INC  
ALTEC LANSING  
CCA ELECTRONICS CORPORATION  
ELECTRONIC SYSTEM ENGINEERING  
GATES RADIO COMPANY  
G E VISUAL COMMUNICATIONS PROO  
LANGEVIN  
ORBIT RADIO  
PERMOFLUX CORPORATION  
RCA BROADCAST PROOS.  
ROUND HILL ASSOCIATES  
H. H. SCOTT, INCORPORATED  
SINGER PRODUCTS CO.  
SOUTHWESTERN COMMUNICATIONS  
STANCILO-HOFFMAN CORPORATION  
STEPHENS ELECTRONICS  
TAPECASTER ELECTRONICS  
TELETRONIX  
TREPAC CORPORATION OF AMERICA  
VISUAL ELECTRONICS CORP  
WARD ELECTRONIC INDUSTRIES

AMPLIFIER, AF, REVERBERATION

AMPLIFIER CORP OF AMERICA  
AUDIO INSTRUMENT CO  
BAUER ELECTRONICS CORPORATION  
CALIFONE/ROBERTS  
GREGORY AMPLIFIER CORP  
NORTH AMERICAN PHILIPS CO  
ORBIT RADIO  
ROUND HILL ASSOCIATES  
SINGER PRODUCTS CO  
SOUTHWESTERN COMMUNICATIONS  
STEPHENS ELECTRONICS  
VISUAL ELECTRONICS CORP

AMPLIFIER, AF, STEREO

ALLIED ELECTRONICS CORP  
ALMA ENGINEERING INC  
ALTEC LANSING  
BAUER ELECTRONICS CORPORATION  
ALBEST ELECTRONICS  
CENTRAL DYNAMICS CORPORATION  
CROWN INTERNATIONAL  
ELECTRO-SOUND ACOUSTICS  
ELECTRO-VOICE INC  
ELECTRONICS ESSENTIALS OF CCC  
GATES RADIO COMPANY  
G E VISUAL COMMUNICATIONS PROO  
HEATH CO  
JETRONIC INDUSTRIES, INC.  
KARG LABORATORIES  
KOSS ELECTRONICS, INC.  
JAMES B LANSING SOUND CO  
MAGNECORD  
MARANTZ COMPANY  
MELCOR ELECTRONICS  
ORBIT RADIO  
PERMOFLUX CORPORATION  
RCA BROADCAST PROOS.  
ROUND HILL ASSOCIATES  
RUSSCO ELECTRONICS MFG.  
H. H. SCOTT, INCORPORATED  
SCULLY RECORDING INSTRUMENTS  
SETCHELL CARLSON INCORPORATED  
SONY CORPORATION OF AMERICA  
SOUTHWESTERN COMMUNICATIONS  
STEPHENS ELECTRONICS  
TELETRON INDUSTRIES CORP  
VIKING OF MINNEAPOLIS

AMPLIFIER, BRIDGING

ALMA ENGINEERING INC  
ALTEC LANSING  
AMECO, INC.  
AMPLIVISION CORPORATION  
ANACONDA ASTRODATA CO  
BAUER ELECTRONICS CORPORATION  
C-COR ELECTRONICS  
DELTA ELECTRONICS, INC.  
GATES RADIO COMPANY  
INTERNATIONAL NUCLEAR CORP.  
JERROLO ELECTRONICS CORP  
LANGEVIN  
LINDSAY SPECIALTY PRODUCTS  
ORBIT RADIO  
RCA BROADCAST PROOS.  
ROUND HILL ASSOCIATES  
H. H. SCOTT, INCORPORATED  
SINGER PRODUCTS CO.  
SOUNDCRAFT INDUSTRIES  
SOUTHWESTERN COMMUNICATIONS  
SPENCER-KENNEY LABORATORIES

STANCILO-HOFFMAN CORPORATION  
STEPHENS ELECTRONICS  
THE TECHNICAL MATERIEL CORP  
WARD ELECTRONIC INDUSTRIES

AMPLIFIER, CATV

AMECO, INC.  
AMERICAN ELECTRONIC LABS  
AMPLIVISION CORPORATION  
ANACONDA ASTRODATA CO  
KEITH ANDERSON CO  
RALL BROTHERS RESEARCH  
BENCO TELEVISION ASSOCIATES  
BLONDER-TONGUE LABORATORIES  
C-COR ELECTRONICS  
CRAFTSMAN ELECTRONICS PRODUCTS  
ENTRON INC  
GBC AMERICA CORPORATION  
JERROLO ELECTRONICS CORP  
KAISER-COX  
LINDSAY SPECIALTY PRODUCTS  
MICROMEGA  
ROUND HILL ASSOCIATES  
SPENCER-KENNEY LABORATORIES  
TELESIS CORPORATION

AMPLIFIER, CLAMPING

RAYTHEON CO EQUIPMENT DIVISION

AMPLIFIER, OC

ALTEC LANSING  
BAUER ELECTRONICS CORPORATION  
BIRNS & SAWYER  
C-COR ELECTRONICS  
COMU ELECTRONICS  
GENERAL RADIO CO  
MELCOR ELECTRONICS  
MILES REPRODUCER CO  
MOSELEY ASSOCIATES INC.  
VIDEON CORPORATION

AMPLIFIER, DISTRIBUTION

ALMA ENGINEERING INC  
ALTEC LANSING  
AMECO, INC.  
AMPLIVISION CORPORATION  
ANACONDA ASTRODATA CO  
APPLIFO ELECTRO-MECHANICS  
ASCO SONOCRAFT CORP  
BALL BROTHERS RESEARCH  
BLONDER-TONGUE LABORATORIES  
BROADCAST ELECTRONICS, INC  
CCA ELECTRONICS CORPORATION  
C-COR ELECTRONICS  
CENTRAL DYNAMICS CORPORATION  
COMU ELECTRONICS  
COOKE ENGINEERING COMPANY  
FLTA ELECTRONICS, INC.  
OYNAIR ELECTRONICS, INC.  
INTERNATIONAL NUCLEAR CORP.  
JERROLO ELECTRONICS CORP  
LINDSAY SPECIALTY PRODUCTS  
MARCONI DIVISION  
MCMARTIN INDUSTRIES  
MELCOR ELECTRONICS  
NORTH AMERICAN PHILIPS CO  
ORBIT RADIO  
RCA BROADCAST PROOS.  
RIKER VIDEO INDUSTRIES  
ROUND HILL ASSOCIATES  
SARKES-TARZIAN  
SPENCER-KENNEY LABORATORIES  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEMET COMPANY  
TELEQUIP CORPORATION  
TELEVISION UTILITIES CORP  
VIDEON CORPORATION  
VISUAL ELECTRONICS CORP  
VITAL INDUSTRIES  
WARD ELECTRONIC INDUSTRIES

AMPLIFIER, KEYING

RCA BROADCAST PROOS.  
RIKER VIDEO INDUSTRIES  
TELEMET COMPANY

AMPLIFIER, MASKING

C B S LABORATORIES  
RCA BROADCAST PROOS.  
RIKER VIDEO INDUSTRIES

AMPLIFIER, PULSE

ALMA ENGINEERING INC  
ALTEC LANSING  
APPLIED ELECTRO-MECHANICS  
C-COR ELECTRONICS  
CENTRAL DYNAMICS CORPORATION  
COMU ELECTRONICS  
OYNAIR ELECTRONICS, INC.  
GENERAL RADIO CO  
INTERNATIONAL NUCLEAR CORP.  
MARCONI DIVISION  
MICROWAVE ASSOCIATES, INC.  
RCA BROADCAST PROOS.  
RIKER VIDEO INDUSTRIES  
SARKES-TARZIAN  
STEPHENS ELECTRONICS  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEMET COMPANY  
TELEQUIP CORPORATION  
VISUAL ELECTRONICS CORP  
WARD ELECTRONIC INDUSTRIES

AMPLIFIER, RF, GENERAL PURPOSE

AMECO, INC.  
AMPLIVISION CORPORATION  
KEITH ANDERSON CO  
BLONDER-TONGUE LABORATORIES  
CCA ELECTRONICS CORPORATION  
C-COR ELECTRONICS  
GATES RADIO COMPANY  
GENERAL RADIO CO  
JERROLO ELECTRONICS CORP  
MCMARTIN INDUSTRIES  
MICROMEGA  
MULTRONICS

RCA BROADCAST PROOS.  
RHG ELECTRONICS LABORATORY  
SINGER PRODUCTS CO.  
STANDARO ELECTRONICS CORP

AMPLIFIER, RF, PEAK LIMITING

BEAR ELECTRONICS LABORATORY  
CCA ELECTRONICS CORPORATION  
MCMARTIN INDUSTRIES  
MICROWAVE ASSOCIATES, INC.  
RCA BROADCAST PROOS.  
ROHDE & SCHWARZ SALES CO. -USA  
SINGER PRODUCTS CO.

AMPLIFIER, RF, POWER

AMERICAN ELECTRONIC LABS  
KEITH ANDERSON CO  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
C-COR ELECTRONICS  
CONTINENTAL ELECTRONICS MFG  
COURIER COMMUNICATIONS  
EIMAC DIVISION OF VARIAN  
GATES RADIO COMPANY  
G E VISUAL COMMUNICATIONS PROO  
GENERAL RADIO CO  
E F JOHNSON COMPANY  
MCMARTIN INDUSTRIES  
MICROWAVE ASSOCIATES, INC.  
MILES REPRODUCER CO  
MULTRONICS  
RCA BROADCAST PROOS.  
RHG ELECTRONICS LABORATORY  
SINGER PRODUCTS CO.  
THE TECHNICAL MATERIEL CORP  
TELETRONIX

AMPLIFIER, SENSING

APPLIED ELECTRO-MECHANICS  
BROADCAST PRODUCTS COMPANY  
HOUSTON ELECTRONICS CO.  
INTERNATIONAL GOOD MUSIC  
RIKER VIDEO INDUSTRIES  
SCHAFER ELECTRONICS  
WARD ELECTRONIC INDUSTRIES

AMPLIFIER, STABILIZING

RALL BROTHERS RESEARCH  
CENTRAL DYNAMICS CORPORATION  
INTERNATIONAL NUCLEAR CORP.  
MARCONI DIVISION  
RCA BROADCAST PROOS.  
RIKER VIDEO INDUSTRIES  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEMET COMPANY  
TELEQUIP CORPORATION  
VISUAL ELECTRONICS CORP  
VITAL INDUSTRIES  
WARD ELECTRONIC INDUSTRIES

AMPLIFIER, TV, BOOSTER

AMECO, INC.  
AMPLIVISION CORPORATION  
ANACONDA ASTRODATA CO  
BENCO TELEVISION ASSOCIATES  
BLONDER-TONGUE LABORATORIES  
C-COR ELECTRONICS  
CRAFTSMAN ELECTRONICS PRODUCTS  
THE FINNEY CO  
JERROLO ELECTRONICS CORP  
LINDSAY SPECIALTY PRODUCTS  
MICROWAVE ASSOCIATES, INC.  
RCA BROADCAST PROOS.  
TELEMET COMPANY

AMPLIFIER, TV, VIDEO

ALMA ENGINEERING INC  
AMPLIVISION CORPORATION  
APPLIED ELECTRO-MECHANICS  
BALL BROTHERS RESEARCH  
BLONDER-TONGUE LABORATORIES  
CATEL COMPANY  
C-COR ELECTRONICS  
CENTRAL DYNAMICS CORPORATION  
COMU ELECTRONICS  
OYNAIR ELECTRONICS, INC.  
GBC AMERICA CORPORATION  
G E VISUAL COMMUNICATIONS PROO  
INTERNATIONAL NUCLEAR CORP.  
MARCONI DIVISION  
RAYTHEON CO EQUIPMENT DIVISION  
RCA BROADCAST PROOS.  
RIKER VIDEO INDUSTRIES  
SARKES-TARZIAN  
STANDARO ELECTRONICS CORP  
TELEMATION, INC.  
TELEMET COMPANY  
TELEQUIP CORPORATION  
VIDEON CORPORATION  
VISUAL ELECTRONICS CORP  
VITAL INDUSTRIES  
WARD ELECTRONIC INDUSTRIES

AMPLIFIER, VIDEO, SWEEP

ALMA ENGINEERING INC  
AMPLIVISION CORPORATION  
BLONDER-TONGUE LABORATORIES  
HEWLETT-PACKARD CO.  
RCA BROADCAST PROOS.  
ROHDE & SCHWARZ SALES CO. -USA  
VISUAL ELECTRONICS CORP

ANALYZERS, DISTORTION

AUDIO INSTRUMENT CO  
BARKER & WILLIAMSON  
GENERAL RADIO CO  
HEWLETT-PACKARD CO.  
MARCONI INSTRUMENTS  
NORTHEAST ELECTRONICS CORP  
ROHDE & SCHWARZ SALES CO. -USA  
THE SINGER CO - METRICS DIV  
WAVEFORMS, INCORPORATED

ANALYZERS, HARMONIC

BARKER & WILLIAMSON

GENERAL RADIO CO  
HEWLETT-PACKARD CO.  
MARCONI INSTRUMENTS  
ROHDE & SCHWARZ SALES CO. -USA  
THE SINGER CO - METRICS DIV

ANALYZERS, INTERMOULATION

AUDIO INSTRUMENT CO  
THE SINGER CO - METRICS DIV

ANALYZERS, NOISE

GENERAL MICROWAVE CORPORATION  
GENERAL RADIO CO  
HEWLETT-PACKARD CO.  
NORTHEAST ELECTRONICS CORP  
ROHDE & SCHWARZ SALES CO. -USA  
H. H. SCOTT, INCORPORATED  
THE SINGER CO - METRICS DIV

ANALYZERS, SIOERANO

OYNAIR ELECTRONICS, INC.  
RCA BROADCAST PROOS.  
ROHDE & SCHWARZ SALES CO. -USA  
THE SINGER CO - METRICS DIV  
THE TECHNICAL MATERIEL CORP  
WARD ELECTRONIC INDUSTRIES

ANALYZERS, SPECTRUM

TEKTRONIX INC

ANALYZERS, VIDEO

COLORADO VIDEO  
HEWLETT-PACKARD CO.  
KRS INSTRUMENTS DIVISION  
ROHDE & SCHWARZ SALES CO. -USA  
THE SINGER CO - METRICS DIV  
VIDEON CORPORATION

ANCHORS, GUY

ADVANCE INDUSTRIES  
AMECO, INC.  
AIRNRACH CO  
G C ELECTRONICS COMPANY  
LIBERTY TOWER MFG. CO  
LITTLE JOE ENTERPRISES

ANTENNAS, AM

ADVANCE INDUSTRIES  
ANTENNA PRODUCTS COMPANY  
CCA ELECTRONICS CORPORATION  
GATES RADIO COMPANY  
JAMPRO ANTENNA COMPANY  
JERROLO ELECTRONICS CORP  
RCA BROADCAST PROOS.  
SCALA RADIO CORPORATION  
SINGER PRODUCTS CO.  
STAINLESS, INC.  
SWAGER TOWER CORPORATION  
TELETRONIX  
TRYLON INCORPORATED  
VISUAL ELECTRONICS CORP

ANTENNAS, FM

ALFORD MANUFACTURING COMPANY  
ALLIED ELECTRONICS CORP  
AMECO, INC.  
ANTENNA PRODUCTS COMPANY  
APPARATUS DEVELOPMENT CO  
BLONDER-TONGUE LABORATORIES  
BROWNING LABORATORIES, INC.  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
THE FINNEY CO  
GATES RADIO COMPANY  
G C ELECTRONICS COMPANY  
JAMPRO ANTENNA COMPANY  
JERROLO ELECTRONICS CORP  
LINDSAY SPECIALTY PRODUCTS  
MARTI ELECTRONICS  
MCMARTIN INDUSTRIES  
RCA BROADCAST PROOS.  
ROBINS INDUSTRIES CORP.  
SCALA RADIO CORPORATION  
SINGER PRODUCTS CO  
SITCO ANTENNA CO.  
TECHNICAL APPLIANCE CORP  
TELETRONIX  
THOMSON ELECTRIC CO  
VISUAL ELECTRONICS CORP

ANTENNAS, LF

MULTRONICS

ANTENNAS, MF

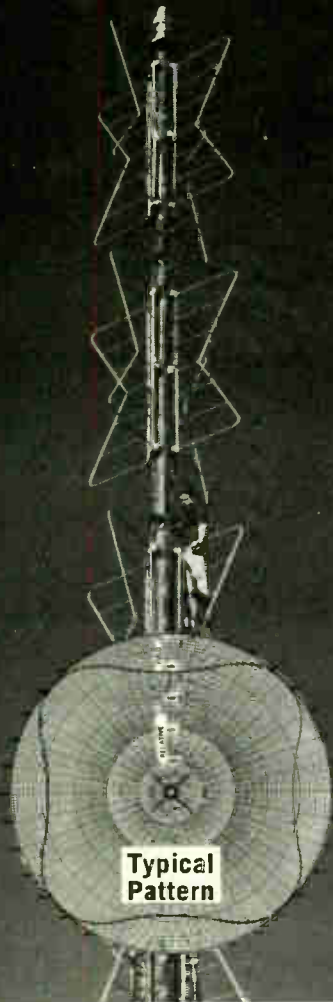
MULTRONICS

ANTENNAS, MICROWAVE

ADVANCE INDUSTRIES  
AMECO, INC.  
AMERICAN ELECTRONIC LABS  
ANDREW CORPORATION  
DEMORNAV - BONAROI DIVISION  
FORT WORTH TOWER CO., INC.  
JERROLO ELECTRONICS CORP  
LITTON EDUCATIONAL TELE DIV  
MICRO-LINK SYSTEMS/VARIAN ASSO  
MOTOROLA COMMUNICATIONS  
NARDA MICROWAVE CORPORATION  
PRODELIN, INCORPORATED  
RAYTHEON CO EQUIPMENT DIVISION

# for TOP PERFORMANCE in TV ANTENNAS

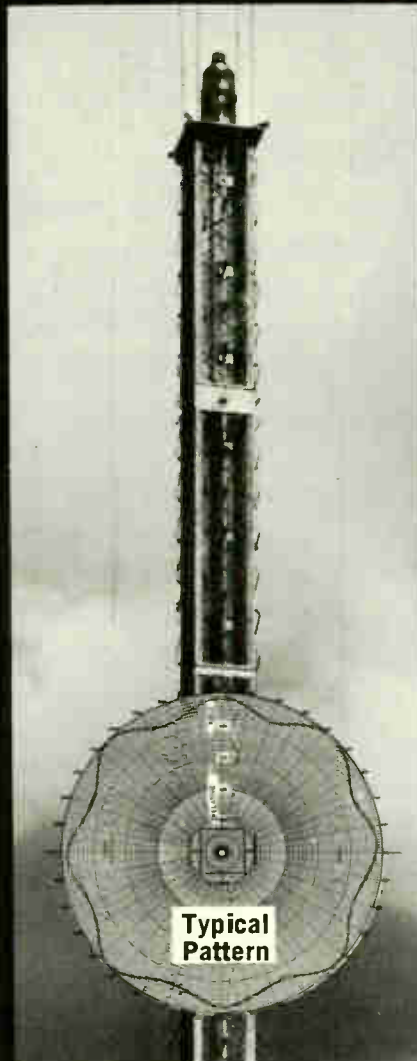
## VHF SUPER TURNSTILE



Typical  
Pattern

**DESCRIPTION**  
Improved mechanical construction  
Wide variety of Gains  
Power rating to 50 kw  
Beam tilting and null fill available at no increase in cost

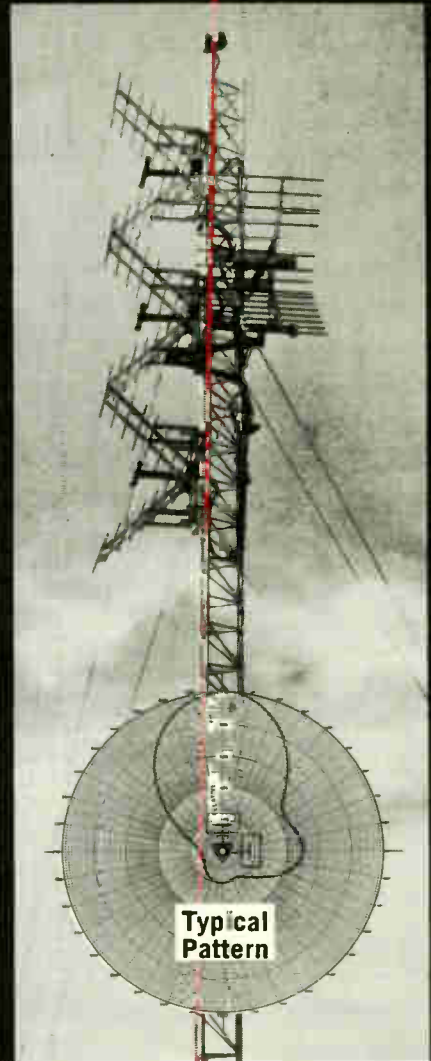
## UHF ZIG ZAG



Typical  
Pattern

**DESCRIPTION**  
Simple panel construction  
All copper elements  
All Teflon insulated  
Low VSWR  
Inputs to 60 kw  
Gain of about 30 per panel

## CORNER REFLECTORS



Typical  
Pattern

**DESCRIPTION**  
Wide variety of frequencies from Channel 2 through 83  
Low VSWR  
Versatile for fill in or directionals  
Gains of generally around 10 per corner

# J A M P R O

- TV Antennas
- Coax Switches
- Notch Diplexers
- FM Antennas
- Harmonic Filters
- ETV Antennas

**ANTENNA COMPANY**  
6939 POWER INN ROAD  
SACRAMENTO, CALIFORNIA

RCA BROADCAST PRODS.  
 ROMDE & SCHWARZ SALES CO. -USA  
 SCIENTIFIC-ATLANTA  
 SINGER PRODUCTS CO  
 STAINLESS, INC.  
 TECHNICAL APPLIANCE CORP  
 VISUAL ELECTRONICS CORP

ANTENNAS, MOBILE  
 ANDREW CORPORATION  
 F & M SYSTEMS COMPANY  
 GATES RADIO COMPANY  
 G C ELECTRONICS COMPANY  
 HY-GAIN ELECTRONICS  
 JERROLD ELECTRONICS CORP  
 HFRB KRECKMAN CO  
 LINDSAY SPECIALTY PRODUCTS  
 MARTI ELECTRONICS  
 MOTOROLA COMMUNICATIONS  
 PRODELIN, INCORPORATED  
 RCA BROADCAST PRODS.  
 SINGER PRODUCTS CO  
 TECHNICAL APPLIANCE CORP  
 UTICA CORPORATION  
 WATERS MANUFACTURING

ANTENNAS, REMOTE PICKUP  
 HERB KRECKMAN CO

ANTENNAS, TV  
 ALFORD MANUFACTURING COMPANY  
 ALLIED ELECTRONICS CORP  
 BLONDER-TONGUE LABORATORIES  
 FMCEE  
 THE FINNEY CO  
 GATES RADIO COMPANY  
 G C ELECTRONICS COMPANY  
 G E VISUAL COMMUNICATIONS PROO  
 JAMPRO ANTENNA COMPANY  
 JERROLD ELECTRONICS CORP  
 LINDSAY SPECIALTY PRODUCTS  
 MARCONI DIVISION  
 PACIFIC TOWER CO  
 RCA BROADCAST PRODS.  
 SCALA RADIO CORPORATION  
 SINGER PRODUCTS CO.  
 TECHNICAL APPLIANCE CORP  
 THOMSON ELECTRIC CO  
 VISUAL ELECTRONICS CORP

ANTENNAS, TV, MASTER-COMMUNITY  
 AMECO, INC.  
 AMPLIVISION CORPORATION  
 ANTENNA PRODUCTS COMPANY  
 BENCO TELEVISION ASSOCIATES  
 BLONDER-TONGUE LABORATORIES  
 CUSH CRAFT  
 THE FINNEY CO  
 JERROLD ELECTRONICS CORP  
 LINDSAY SPECIALTY PRODUCTS  
 SCALA RADIO CORPORATION  
 SCIENTIFIC-ATLANTA  
 SITCO ANTENNA CO.  
 STAINLESS, INC  
 TECHNICAL APPLIANCE CORP

ANTENNAS, 2500 MHZ  
 ALFORD MANUFACTURING COMPANY  
 AMERICAN ELECTRONIC LABS  
 ANDREW CORPORATION  
 JAMPRO ANTENNA COMPANY  
 JERROLD ELECTRONICS CORP  
 LITTON EDUCATIONAL TELE DIV  
 NAROA MICROWAVE CORPORATION  
 PRODELIN, INCORPORATED  
 RAYTHEON CO EQUIPMENT DIVISION  
 RCA BROADCAST PRODS.  
 SCIENTIFIC-ATLANTA  
 TECHNICAL APPLIANCE CORP

ANTENNAS, SYSTEMS, HF  
 DELTA ELECTRONICS INC

ARMS, PHONOGRAPH -  
SEE ARMS, TONE

ARMS, TONE  
 THE ASIATIC CORPORATION  
 EUPHONICS MARKETING  
 GATES RADIO COMPANY  
 GOTHAM AUDIO CORPORATION  
 GRAY RESEARCH & DEVELOPMENT CO  
 KOSS ELECTRONICS, INC.  
 RCA BROADCAST PRODS.  
 SHURE BROTHERS, INC.  
 SINGER PRODUCTS CO  
 SONY CORPORATION OF AMERICA

ATTENUATORS, AUDIO  
 ALTEC LANSING  
 AMECO, INC.  
 CENTRALAB  
 FAIRCHILD RECORDING EQUIPMENT  
 GENERAL RADIO CO  
 HEWLETT-PACKARD CO.  
 JORDAN ELECTRIC COMPANY  
 LANGEVIN  
 MALLORY DISTRIBUTOR PRODUCTS  
 MICROLAB / FXR  
 PAINTON INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 SOUNOCRAFT INDUSTRIES  
 SOUTHWESTERN COMMUNICATIONS  
 STEPHENS ELECTRONICS  
 TELONIC INDUSTRIES  
 TROMPETER ELECTRONICS

ATTENUATORS, FIXED  
 ALTEC LANSING  
 BIRD ELECTRONIC CORPORATION  
 GENERAL MICROWAVE CORPORATION  
 GENERAL RADIO CO  
 GOTHAM AUDIO CORPORATION  
 HEWLETT-PACKARD CO.  
 HOLLAND ELECTRONICS INC  
 JERROLD ELECTRONICS CORP  
 JORDAN ELECTRIC COMPANY

ATTENUATORS, MICROWAVE  
 AMECO, INC.  
 DEMORNAY - BONARDI DIVISION  
 GENERAL MICROWAVE CORPORATION  
 GENERAL RADIO CO  
 HEWLETT-PACKARD CO.  
 JERROLD ELECTRONICS CORP  
 MICROLAB / FXR  
 MICROWAVE ASSOCIATES, INC.  
 NAROA MICROWAVE CORPORATION  
 OHMITE MANUFACTURING COMPANY  
 PAINTON INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 SOUTHWESTERN COMMUNICATIONS  
 TROMPETER ELECTRONICS

ATTENUATORS, VIDEO  
 AMECO, INC.  
 CENTRAL DYNAMICS CORPORATION  
 HOLLAND ELECTRONICS INC  
 NAROA MICROWAVE CORPORATION  
 PAINTON INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 SARKES-TARZIAN  
 SCIENTIFIC-ATLANTA  
 TELONIC INDUSTRIES  
 TROMPETER ELECTRONICS  
 WATERS MANUFACTURING

AUTOMATION, EQUIPMENT  
 ATTKEN COMMUNICATIONS  
 AMECO, INC.  
 BROADCAST ELECTRONICS, INC  
 BROADCAST PRODUCTS COMPANY  
 CCA ELECTRONICS CORPORATION  
 CENTRAL DYNAMICS CORPORATION  
 CHRONO-LOG CORPORATION  
 CONTINENTAL ELECTRONICS MFG  
 DELTA ELECTRONICS, INC.  
 F & M SYSTEMS COMPANY  
 GATES RADIO COMPANY  
 HANCOCK TELECONTROL  
 INTERNATIONAL GOOD MUSIC  
 KRS INSTRUMENTS DIVISION  
 MACARTA INC.  
 MACKENZIE LABORATORIES  
 MID AMERICA ELECTRONICS CORP  
 ORBIT RADIO  
 RCA BROADCAST PRODS.  
 RIKER VIDEO INDUSTRIES  
 SARKES-TARZIAN  
 SCHAFFER ELECTRONICS  
 SCULLY RECORDING INSTRUMENTS  
 SINGER PRODUCTS CO  
 S. STERLING COMPANY  
 TAPEMASTER ELECTRONICS  
 TELESIS CORPORATION  
 TREPAC CORPORATION OF AMERICA  
 TROMPETER ELECTRONICS  
 VISUAL ELECTRONICS CORP  
 WARD ELECTRONIC INDUSTRIES

BACKGROUND MUSIC SERVICE  
 AMECO, INC.  
 ASCO SONOCRAFT CORP  
 BROWNING LABORATORIES, INC.  
 CCA ELECTRONICS CORPORATION  
 CINE SONIC SOUND  
 THE JAMES FLOYD FORD CO  
 INTERNATIONAL GOOD MUSIC  
 MAGNETRONICS, INC.  
 MCMARTIN INDUSTRIES  
 MINNESOTA MINING - 3 M  
 MOTOROLA COMMUNICATIONS  
 ORBIT RADIO  
 SCHAFFER ELECTRONICS

ATTENUATORS, IMPEDANCE MATCHING  
 ALTEC LANSING  
 AMECO, INC.  
 HOLLAND ELECTRONICS INC  
 JERROLD ELECTRONICS CORP  
 MICROLAB / FXR  
 MICROWAVE ASSOCIATES, INC.  
 NAROA MICROWAVE CORPORATION  
 OHMITE MANUFACTURING COMPANY  
 PAINTON INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 SOUTHWESTERN COMMUNICATIONS  
 TROMPETER ELECTRONICS

ATTENUATORS, MICROWAVE  
 AMECO, INC.  
 DEMORNAY - BONARDI DIVISION  
 GENERAL MICROWAVE CORPORATION  
 GENERAL RADIO CO  
 HEWLETT-PACKARD CO.  
 JERROLD ELECTRONICS CORP  
 MICROLAB / FXR  
 MICROWAVE ASSOCIATES, INC.  
 NAROA MICROWAVE CORPORATION  
 PRODELIN, INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 SCIENTIFIC-ATLANTA  
 THE SINGER CO - METRICS DIV  
 TELONIC INDUSTRIES

ATTENUATORS, RF  
 AMECO, INC.  
 BENCO TELEVISION ASSOCIATES  
 BIRD ELECTRONIC CORPORATION  
 BLONDER-TONGUE LABORATORIES  
 GENERAL MICROWAVE CORPORATION  
 GENERAL RADIO CO  
 HEWLETT-PACKARD CO.  
 HOLLAND ELECTRONICS INC  
 JERROLD ELECTRONICS CORP  
 MARCONI INSTRUMENTS  
 MICROLAB / FXR  
 MICROWAVE ASSOCIATES, INC.  
 NAROA MICROWAVE CORPORATION  
 PAINTON INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 SCIENTIFIC-ATLANTA  
 THE SINGER CO - METRICS DIV  
 TELONIC INDUSTRIES

ATTENUATORS, VIDEO  
 AMECO, INC.  
 CENTRAL DYNAMICS CORPORATION  
 HOLLAND ELECTRONICS INC  
 NAROA MICROWAVE CORPORATION  
 PAINTON INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 SARKES-TARZIAN  
 SCIENTIFIC-ATLANTA  
 TELONIC INDUSTRIES  
 TROMPETER ELECTRONICS

AUTOMATION, EQUIPMENT  
 ATTKEN COMMUNICATIONS  
 AMECO, INC.  
 BROADCAST ELECTRONICS, INC  
 BROADCAST PRODUCTS COMPANY  
 CCA ELECTRONICS CORPORATION  
 CENTRAL DYNAMICS CORPORATION  
 CHRONO-LOG CORPORATION  
 CONTINENTAL ELECTRONICS MFG  
 DELTA ELECTRONICS, INC.  
 F & M SYSTEMS COMPANY  
 GATES RADIO COMPANY  
 HANCOCK TELECONTROL  
 INTERNATIONAL GOOD MUSIC  
 KRS INSTRUMENTS DIVISION  
 MACARTA INC.  
 MACKENZIE LABORATORIES  
 MID AMERICA ELECTRONICS CORP  
 ORBIT RADIO  
 RCA BROADCAST PRODS.  
 RIKER VIDEO INDUSTRIES  
 SARKES-TARZIAN  
 SCHAFFER ELECTRONICS  
 SCULLY RECORDING INSTRUMENTS  
 SINGER PRODUCTS CO  
 S. STERLING COMPANY  
 TAPEMASTER ELECTRONICS  
 TELESIS CORPORATION  
 TREPAC CORPORATION OF AMERICA  
 TROMPETER ELECTRONICS  
 VISUAL ELECTRONICS CORP  
 WARD ELECTRONIC INDUSTRIES

BACKGROUND MUSIC SERVICE  
 AMECO, INC.  
 ASCO SONOCRAFT CORP  
 BROWNING LABORATORIES, INC.  
 CCA ELECTRONICS CORPORATION  
 CINE SONIC SOUND  
 THE JAMES FLOYD FORD CO  
 INTERNATIONAL GOOD MUSIC  
 MAGNETRONICS, INC.  
 MCMARTIN INDUSTRIES  
 MINNESOTA MINING - 3 M  
 MOTOROLA COMMUNICATIONS  
 ORBIT RADIO  
 SCHAFFER ELECTRONICS

BASE STATIONS  
 GATES RADIO COMPANY  
 MARTI ELECTRONICS  
 RCA BROADCAST PRODS.  
 SINGER PRODUCTS CO  
 UTICA CORPORATION

BATTERIES, DRY CELL  
 BURGESS BATTERY COMPANY  
 RCA ELECTRONIC COMPONENTS

BATTERIES, LEAD ACID  
 IMPEX ELECTRONICS CORP  
 SINGER PRODUCTS CO

BATTERIES, NICKEL CADMIUM  
 BERKEY TECHNICAL CORP  
 BIRNS & SAWYER  
 COLORTRAN INDUSTRIES - BERKEY  
 G E CAPACITOR DEPARTMENT  
 GENERAL ELECTRIC CO  
 IMPEX ELECTRONICS CORP  
 SINGER PRODUCTS CO.

BATTERIES, OTHER  
 GENERAL ELECTRIC CO

BLOWERS AND FANS  
 AMECO, INC.  
 BUO RADIO, INC  
 DYANCOOL MANUFACTURING CO  
 ENCLOSURE CORP  
 RCA BROADCAST PRODS.  
 ROTRON MANUFACTURING COMPANY  
 SIGMA INDUSTRIES  
 SINGER PRODUCTS CO.

BOXES, DECADE, CAPACITOR  
 AERVOX CORP.  
 GENERAL RADIO CO  
 HEATH CO

BOXES, DECADE, INDUCTOR  
 AERVOX CORP.  
 GENERAL RADIO CO  
 UNITED TRANSFORMER COMPANY

BOXES, DECADE, RESISTOR  
 AERVOX CORP.  
 GENERAL RADIO CO  
 HEATH CO  
 JORDAN ELECTRIC COMPANY  
 OHMITE MANUFACTURING COMPANY

BRIGDES  
 ALFORD MANUFACTURING COMPANY  
 ALTEC LANSING  
 AMECO, INC.  
 BLONDER-TONGUE LABORATORIES  
 DELTA ELECTRONICS INC  
 GENERAL ELECTRIC CO  
 GENERAL MICROWAVE CORPORATION  
 GENERAL RADIO CO  
 HEATH CO  
 HEWLETT-PACKARD CO.  
 HICKOK ELECTRICAL INSTRUMENT  
 JERROLD ELECTRONICS CORP  
 MARCONI INSTRUMENTS  
 ROMDE & SCHWARZ SALES CO. -USA  
 YOKOGAWA ELECTRIC WORKS

BROADCAST PROGRAMMING SERVICE  
 AMECO, INC.  
 ASCO SONOCRAFT CORP  
 BISCAYNE AUDIO COMPANY  
 THE JAMES FLOYD FORD CO  
 HOUSTON ELECTRONICS CO.  
 INTERNATIONAL GOOD MUSIC  
 ORBIT RADIO  
 SCHAFFER ELECTRONICS  
 ALBERT SCHULTZ, INC  
 TELEVISION, INC.

BUILDINGS, PREFABRICATED -  
SEE PREFABRICATED BUILDINGS

CABINETS, METAL  
 ACME VISIBLE RECORDS  
 ALLIED ELECTRONICS CORP  
 AMECO, INC.  
 BUO RADIO, INC  
 BURKE & JAMES  
 CCA ELECTRONICS CORPORATION  
 COOK ELECTRIC COMPANY  
 DATA INSTRUMENT DIVISION  
 ENCLOSURE CORP  
 GATES RADIO COMPANY

CABINETS, PLASTIC  
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 HARWALD COMPANY  
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 ACME VISIBLE RECORDS  
 GRINNAN FUTURE COMPANY  
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 MINNESOTA MINING - 3 M  
 NEUMAQUE PRODUCTS CORPORATION  
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CABLE, COAXIAL, FLEXIBLE  
 ALPHA WIRE

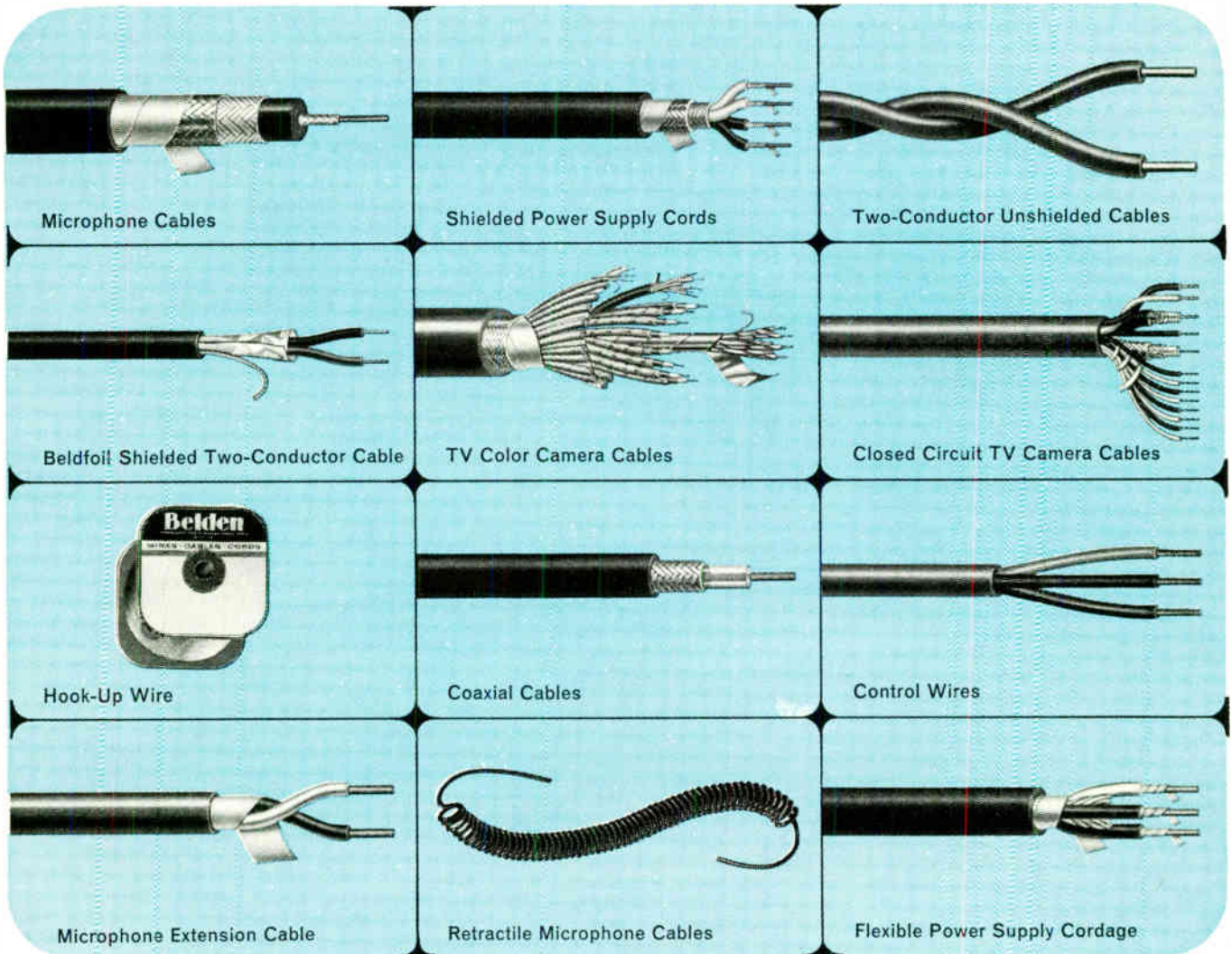
# Why is Belden specified by most broadcast engineers?

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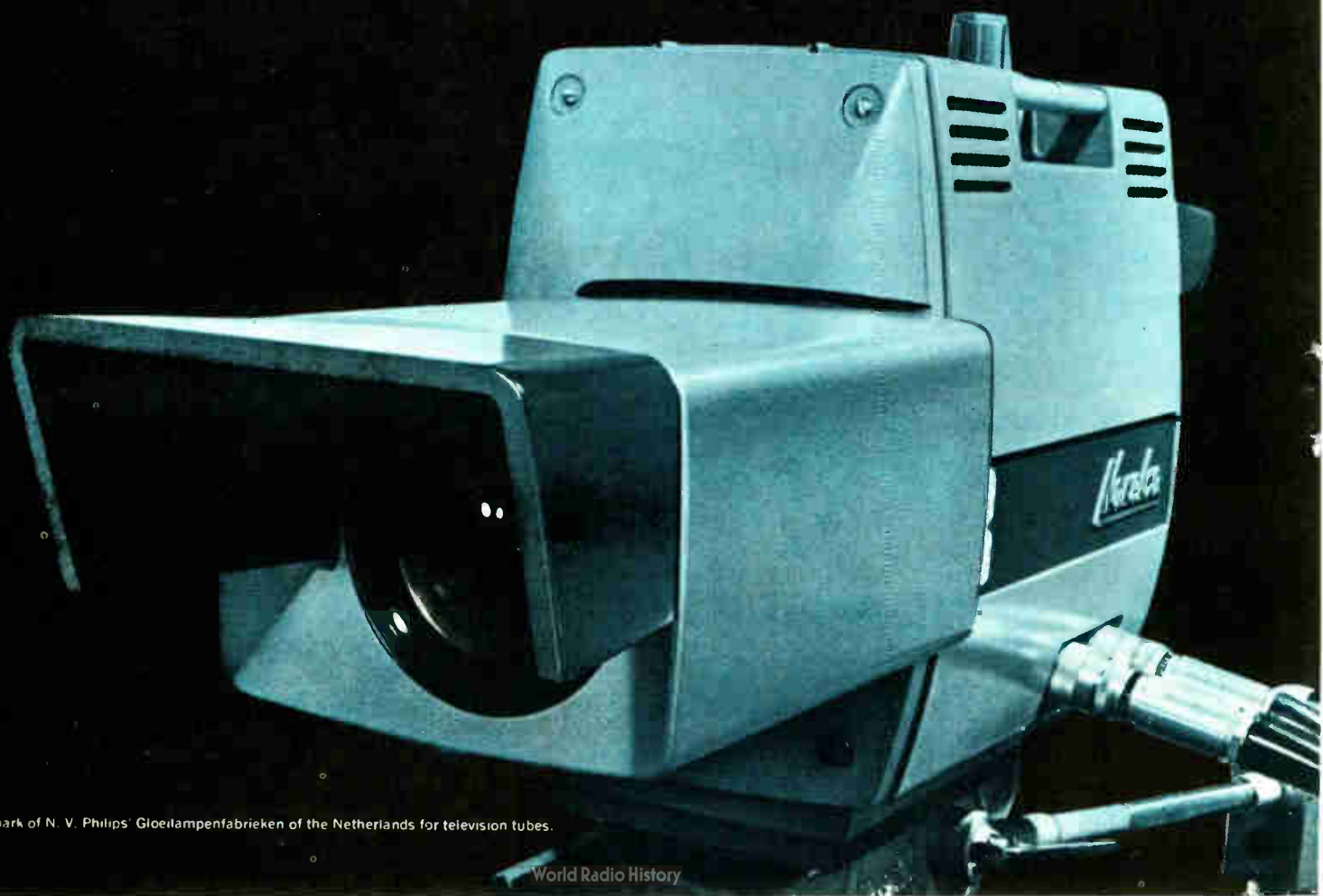


electronic wire and cable

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**Two of the three major networks use  
Norelco cameras for their prime-time color shows.**

**If that doesn't convince you to buy a  
Norelco 3-tube Plumbicon\* color camera,  
take a trip on us.**



Trademark of N. V. Philips' Gloeilampenfabrieken of the Netherlands for television tubes.

World Radio History



This is an invitation to discover—at our expense—the practical, everyday reasons why you should now be using the new Norelco 3-tube Plumbicon rather than any other color TV camera on the market. Do this. Call, or write us direct. We'll schedule and pay for a trip to a station now using the Norelco 3-tube Plumbicon TV camera—subject to the availability of the station's time and technical personnel. They'll tell you and show you why they chose the new Norelco. You'll see it in program action. You'll learn for yourself—at no cost to yourself—why the Norelco Plumbicon TV camera is used for more programming than all other new generation makes.

**Here's a partial list of stations now using the new Norelco**

| EAST                |                         |
|---------------------|-------------------------|
| STATION             | LOCATION                |
| WNHC-TV             | New Haven, Connecticut  |
| WNEW-TV             | New York                |
| REEVES SOUND STUDIO | New York                |
| SOUTH               |                         |
| WAGA-TV             | Atlanta, Georgia        |
| WJBF-TV             | Augusta, Georgia        |
| WCYB-TV             | Bristol, Virginia/Tenn. |
| WKRG-TV             | Mobile, Alabama         |
| WSPA-TV             | Spartanburg, S.C.       |
| MIDWEST             |                         |
| WFIE-TV             | Evansville, Indiana     |
| WFRV-TV             | Green Bay, Wisconsin    |
| WISH-TV             | Indianapolis, Indiana   |
| WEST                |                         |
| KABC-TV             | Los Angeles, California |
| KTTV                | Los Angeles, California |
| KXTV                | Sacramento, California  |

When you visit one of these stations you'll be able to separate the facts from the fiction regarding color TV cameras. Facts and fiction like this:

**FICTION:** A 4-tube camera produces a sharper picture than a 3-tube color camera.

**FACT:** This concept is as obsolete as the 12-cylinder car. The Norelco 3-tube PC-70 Plumbicon Color Camera produces a sharper color and monochrome picture than any 4-tube camera. Reason: the first practical application of the unique "contours-out-of-green" principle provides both horizontal and vertical aperture correction. The contour signal produced from the green channel, is simply fed to all three channels.

**RESULT:** A startling increase in color and monochrome sharpness — on the home receiver—plus the same tolerance to misregistration that a fourth tube provides. All with one less tube, less maintenance, minimum operational make-ready time and trouble-free color matching.

**FICTION:** "Contours-out-of-green" creates an excessive noise problem.

**FACT:** Absolutely not. But some 4-tube cameras do have a noise problem. Check the "specs." You'll discover that these 4-tube models recommend a fixed gamma of 0.5. We provide continuously variable gamma and recommend an 0.45 operating point. This stretches blacks and gives you more detail in dark areas and shadows. A gamma of 0.5 hides noise by compressing blacks. Result: the 4-tube camera loses dark area detail and literally demands the use of flat lighting.

**FICTION:** By this time next year Norelco will be selling a

four tube camera.

**FACT:** Definitely not. We made the best possible 4-tube camera but decided not to sell it. While using it to compare 3-tube vs. 4-tube, we discovered what every 4-tube manufacturer has since learned: 4-tube resolution is inherently less than 3-tube; that extra light split to the Y channel reduces the light to the RGB channels, causing noticeable lag. (Try moving a light object against a dark background with a camera using 4 photo conductor pick-up tubes. You'll see what we mean.)

**FICTION:** The Norelco PC-70 is made in Holland and won't be in full production for years.

**FACT:** The PC-70 camera is made by Norelco in Mt. Vernon, N. Y., where existing and constantly expanding facilities are meeting the demand for the most economical, easiest to use and maintain, color TV camera available today.

**Other reasons to choose the Norelco PC-70:**

A simple but remarkable 3-way beam split prism that eliminates the need for shading controls. (Because of their complicated beam split, many 4-tube models require as many as 16 shading controls.)

No magenta cast, a problem even some of the newest 4-tube cameras haven't solved.

Lens interchangeability.

No set-up operating controls in the camera head except for tube-focus and back-focus positions. Eliminates the need for a two-man set-up and for hectic on-the-set adjustments.

Now get all the reasons to choose the Norelco PC-70. Get them from the men behind the camera. Today, call our sales representative, Visual Electronics, or call us directly.



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900 South Columbus Avenue, Mount Vernon, New York 10550

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TELEQUIP CORPORATION  
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G E ELECTRONICS COMPANY  
G E VISUAL COMMUNICATIONS PROD  
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RCA BROADCAST PRODS.  
ROHNS INDUSTRIES CORP.  
ROME CABLE DIV OF ALCOA  
SAXTON PRODUCTS  
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CENTRALAB  
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CORNELL-DUBILIER ELECTRONICS  
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JERROLD ELECTRONICS CORP  
KAISER-COX  
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TELESIS CORPORATION  
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TELESIS CORPORATION  
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TOWNSEND ASSOCIATES  
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VITRO ELECTRONICS

**CLAMPS, CABLE**

AMECO, INC.  
ANDREW CORPORATION  
BIRNBACH CO  
DIAMOND EXPANSION BOLT CO INC  
G C ELECTRONICS COMPANY  
SUPERIOR CABLE CORPORATION  
THE THOMAS & BETTS CO  
WECKERSSER COMPANY, INC.

**CLAMPS, COMPONENT**

ELECTROVERT, INCORPORATED  
TELEMET COMPANY  
THE THOMAS & BETTS CO

**CLAMPS, GROUND**

AMECO, INC.  
THE THOMAS & BETTS CO

**CLAMPS, TUBE**

THE THOMAS & BETTS CO

**CLEANERS, CHEMICAL -**

ALSO SEE SOLVENTS  
BROADCAST ELECTRONICS, INC  
G C ELECTRONICS COMPANY  
J W GIBSON CO, INC

**CLEANERS, LENS**

DUOTONE COMPANY INC  
THE TEXWIPE COMPANY

**CLEANERS, OTHER -**

ALSO SEE SOLVENTS  
DUOTONE COMPANY INC  
G C ELECTRONICS COMPANY  
NEUMADE PRODUCTS CORPORATION  
THE TEXWIPE COMPANY

**CLIPS, TEST**

BIRNBACH CO  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
HEWLETT-PACKARD CO.  
INDUSTRIAL DEVICES, INC.

**CLOCKS & CHRONOGRAPHS**

CCA ELECTRONICS CORPORATION  
CENTRAL DYNAMICS CORPORATION  
CHRONO-LOG CORPORATION  
G E SUPPLY COMPANY  
GENERAL RADIO CO  
GIBBS MFG. AND RESEARCH CORP.  
RCA BROADCAST PRODS.  
RIKER VIDEO INDUSTRIES  
TEXAS ELECTRONICS

**COILS - ALSO SEE INDUCTANCES**

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BARKER & WILLIAMSON  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
DELTA ELECTRONICS INC  
GATES RADIO COMPANY  
MULTRONICS  
PRODELIN, INCORPORATED  
RCA BROADCAST PRODS.  
TRW ELECTRONICS

**COILS, CHOKE, AF**

ADC PRODUCTS  
ALTEC LANSING  
PERMOFLUX CORPORATION  
TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

**COILS, CHOKE, RF**

ALTEC LANSING  
BARKER & WILLIAMSON  
CALBEST ELECTRONICS  
CCA ELECTRONICS CORPORATION  
O & B ELECTRONICS COMPANY  
GATES RADIO COMPANY  
E F JOHNSON COMPANY  
TRW ELECTRONICS

**COILS, DEFLECTION AND FOCUSING**

AMERICAN ELITE  
CLEVELAND ELECTRONICS  
DEFLECTION COMPONENTS OIV  
CONRAC  
LAKE ELECTRONICS, INC.  
SINGER PRODUCTS CO.  
TELEQUIP CORPORATION  
TRW ELECTRONICS

**COILS, DEGAUSSING**

G C ELECTRONICS COMPANY

**COILS, HYBRID**

ADC PRODUCTS  
ALTEC LANSING  
RCA BROADCAST PRODS.  
UNITED TRANSFORMER COMPANY

**COILS, TELEPHONE**

ADC PRODUCTS  
ALTEC LANSING  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO.  
UNITED TRANSFORMER COMPANY

**COMMUNICATIONS SYSTEMS, CB**

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COURIER COMMUNICATIONS  
F & M SYSTEMS COMPANY  
HEATH CO  
F F JOHNSON COMPANY  
MILES REPRODUCER CO  
MOSELEY ASSOCIATES INC.  
THE NOVA COMPANY  
PRODELIN, INCORPORATED  
RCA ELECTRONIC COMPONENTS  
SINGER PRODUCTS CO.  
UTICA CORPORATION

**COMMUNICATIONS SYSTEMS,**

**INTERCOM, WIRED**  
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AMERICAN ELITE  
AMERICAN GELOSO ELECTRONICS  
ASCO SONOCRAFT CORP  
ATLAS SOUND  
CALBEST ELECTRONICS  
CENTRAL DYNAMICS CORPORATION  
DELTA ELECTRONICS, INC.  
F & M SYSTEMS COMPANY  
FISHER BERKELEY CORPORATION  
THE JAMES FLOYD FORD CO  
HEATH CO  
ITT TELECOMMUNICATIONS  
MCMARTIN INDUSTRIES  
MILES REPRODUCER CO  
RCA BROADCAST PRODS.  
SOUTHWESTERN COMMUNICATIONS  
ULTRA AUDIO PRODUCTS  
VISUAL ELECTRONICS CORP  
WARD ELECTRONIC INDUSTRIES

**COMMUNICATIONS SYSTEMS,**

**INTERCOM, WIRELESS**  
ASCO SONOCRAFT CORP  
DELTA ELECTRONICS, INC.  
F & M SYSTEMS COMPANY  
FISHER BERKELEY CORPORATION  
THE JAMES FLOYD FORD CO  
HEATH CO  
E F JOHNSON COMPANY  
MILES REPRODUCER CO  
ROUND HILL ASSOCIATES  
SOUTHWESTERN COMMUNICATIONS  
UTICA CORPORATION

**COMMUNICATIONS SYSTEMS,**

**LAND MOBILE**  
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AMERICAN ELITE  
AMPEX CORPORATION  
ATLAS SOUND  
CCA ELECTRONICS CORPORATION  
F & M SYSTEMS COMPANY  
THE JAMES FLOYD FORD CO  
J M ELECTRONICS COMPANY  
E F JOHNSON COMPANY  
MARTI ELECTRONICS  
MILES REPRODUCER CO  
MOSELEY ASSOCIATES INC.  
MULTRONICS  
THE NOVA COMPANY  
PRODELIN, INCORPORATED  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO  
SOUTH SHORE RADIO TELEPHONE  
UTICA CORPORATION

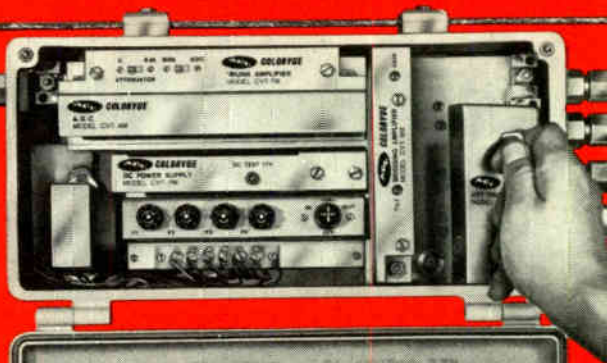
**COMMUNICATIONS SYSTEMS,**

**MICROWAVE**  
ALTEC LANSING  
AMERICAN ELECTRONIC LABS  
AMERICAN ELITE  
AMPLIVISION CORPORATION  
F & M SYSTEMS COMPANY  
ITT TELECOMMUNICATIONS  
JERROLD ELECTRONICS CORP  
LENKURT ELECTRIC CO., INC.  
MARTI ELECTRONICS  
MICROLAB / FXR  
MICRO-LINK SYSTEMS/VARIAN ASS  
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MOSELEY ASSOCIATES INC.  
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RHG ELECTRONICS LABORATORY  
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BELAR ELECTRONICS LABORATORY  
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F & M SYSTEMS COMPANY  
ITT TELECOMMUNICATIONS  
LENKURT ELECTRIC CO., INC.  
MCMARTIN INDUSTRIES  
MOSELEY ASSOCIATES INC.  
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 OISPLAY TECHNOLOGIES INC  
 GENERAL ELECTRIC CO  
 HANCOCK TELECONTROL  
 HARVEY RADIO CO. INC.  
 HEALTH CO  
 MINNESOTA MINING - 3 M  
 SARKES-TARZIAN  
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 THE JAMES FLOYD FORD CO  
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 GENERAL RADIO CO  
 GOTHAM AUDIO CORPORATION  
 ITT CANNON ELECTRIC  
 RCA BROADCAST PRODS.  
 SWITCHCRAFT, INC.  
 TROMPFETER ELECTRONICS

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 AMPHENOL DISTRIBUTOR DIVISION  
 AMPLIVISION CORPORATION  
 BLONDER-TONGUE LABORATORIES  
 G C ELECTRONICS COMPANY  
 ITT CANNON ELECTRIC  
 JERROLD ELECTRONICS CORP  
 PHELPS DODGE  
 PRODELIN, INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 THE TECHNICAL MATERIEL CORP  
 TROMPFETER ELECTRONICS

**CONNECTORS, COAXIAL CABLE**

**AMECO, INC.**  
 AMERICAN CABLE ELECTRONICS  
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 AMPLIVISION CORPORATION  
 ANACONDA ASTRODATA CO  
 ANOREW CORPORATION  
 BENCO TELEVISION ASSOCIATES  
 BLONDER-TONGUE LABORATORIES  
 COOKE ENGINEERING COMPANY  
 CRAFTSMAN ELECTRONICS PRODUCTS  
 ENGINEERING ASSOCIATES  
 ENTRON INC  
 G C ELECTRONICS COMPANY  
 GENERAL RADIO CO  
 ITT CANNON ELECTRIC  
 JERROLD ELECTRONICS CORP  
 KAISER-COX  
 NARDA MICROWAVE CORPORATION  
 PHELPS DODGE  
 PRODELIN, INCORPORATED  
 RCA BROADCAST PRODS.  
 ROMDE & SCHWARZ SALES CO. -USA  
 SIGMA INDUSTRIES  
 SINGER PRODUCTS CO.  
 SPENCER-KENNEDY LABORATORIES  
 SUPERIOR CABLE CORPORATION  
 THE TECHNICAL MATERIEL CORP  
 TELETRONIX  
 THE THOMAS & BETTS CO  
 TIMES WIRE AND CABLE  
 TROMPFETER ELECTRONICS  
 VISUAL ELECTRONICS CORP  
 VITRO ELECTRONICS

**CONNECTORS, POWER**

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 AMERICAN PAMCOR, INC  
 AMPHENOL DISTRIBUTOR DIVISION  
 AMPLIVISION CORPORATION  
 ANDREW CORPORATION  
 BIRD ELECTRONIC CORPORATION  
 CRAFTSMAN ELECTRONICS PRODUCTS  
 ENGINEERING ASSOCIATES  
 ENTRON INC  
 GENERAL RADIO CO  
 ITT CANNON ELECTRIC  
 JERROLD ELECTRONICS CORP  
 MICROWAVE ASSOCIATES, INC.  
 NARDA MICROWAVE CORPORATION  
 PHELPS DODGE  
 PRODELIN, INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 SUPERIOR CABLE CORPORATION  
 SWITCHCRAFT, INC.  
 THE TECHNICAL MATERIEL CORP  
 THE THOMAS & BETTS CO  
 TIMES WIRE AND CABLE  
 TROMPFETER ELECTRONICS  
 VITRO ELECTRONICS

**CONNECTORS, RF**

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 AMERICAN PAMCOR, INC  
 AMPHENOL DISTRIBUTOR DIVISION  
 AMPLIVISION CORPORATION  
 ANDREW CORPORATION  
 BIRD ELECTRONIC CORPORATION  
 CRAFTSMAN ELECTRONICS PRODUCTS  
 ENGINEERING ASSOCIATES  
 ENTRON INC  
 GENERAL RADIO CO  
 ITT CANNON ELECTRIC  
 JERROLD ELECTRONICS CORP  
 MICROWAVE ASSOCIATES, INC.  
 NARDA MICROWAVE CORPORATION  
 PHELPS DODGE  
 PRODELIN, INCORPORATED  
 ROMDE & SCHWARZ SALES CO. -USA  
 SUPERIOR CABLE CORPORATION  
 SWITCHCRAFT, INC.  
 THE TECHNICAL MATERIEL CORP  
 THE THOMAS & BETTS CO  
 TIMES WIRE AND CABLE  
 TROMPFETER ELECTRONICS  
 VITRO ELECTRONICS

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 CCA ELECTRONICS CORPORATION

COLLINS RADIO COMPANY  
 CROWN INTERNATIONAL  
 FAIRCHILD RECORDING EQUIPMENT  
 G E VISUAL COMMUNICATIONS PROD  
 GOTHAM AUDIO CORPORATION  
 HOUSTON ELECTRONICS CO.  
 IMPEX ELECTRONICS CORP  
 MIO AMERICA ELECTRONICS CORP  
 RCA BROADCAST PRODS.  
 SINGER PRODUCTS CO  
 SPARTA ELECTRONIC CORPORATION  
 STEPHENS ELECTRONICS  
 TELETRONIX  
 UNITED RADIO SUPPLY, INC  
 VISUAL ELECTRONICS CORP  
 WILKINSON ELECTRONICS, INC

**CONSOLE, AUDIO, FM**

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 BAUER ELECTRONICS CORPORATION  
 CCA ELECTRONICS CORPORATION  
 COLLINS RADIO COMPANY  
 FAIRCHILD RECORDING EQUIPMENT  
 GATES RADIO COMPANY  
 GOTHAM AUDIO CORPORATION  
 HARVEY RADIO CO. INC.  
 HOUSTON ELECTRONICS CO.  
 IMPEX ELECTRONICS CORP  
 LITTLE JOE ENTERPRISES  
 MID AMERICA ELECTRONICS CORP  
 ORBIT RADIO  
 RCA BROADCAST PRODS.  
 SINGER PRODUCTS CO  
 SOUTHWESTERN COMMUNICATIONS  
 SPARTA ELECTRONIC CORPORATION  
 STANDARD ELECTRONICS CORP.  
 STEPHENS ELECTRONICS  
 TELETRONIX  
 ULTRA AUDIO PRODUCTS  
 VISUAL ELECTRONICS CORP  
 WARD ELECTRONIC INDUSTRIES  
 WILKINSON ELECTRONICS, INC

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 CCA ELECTRONICS CORPORATION  
 DATA INSTRUMENT DIVISION  
 DELTA ELECTRONICS, INC.  
 GATES RADIO COMPANY  
 G E VISUAL COMMUNICATIONS PROD  
 GOTHAM AUDIO CORPORATION  
 HARVEY RADIO CO. INC.  
 HOUSTON ELECTRONICS CO.  
 IMPEX ELECTRONICS CORP  
 LANG ELECTRONICS, INC  
 LITTLE JOE ENTERPRISES  
 MIO AMERICA ELECTRONICS CORP  
 NORTH AMERICAN PHILIPS CO  
 ORBIT RADIO  
 RCA BROADCAST PRODS.  
 SINGER PRODUCTS CO  
 SOUTHWESTERN COMMUNICATIONS  
 SPARTA ELECTRONIC CORPORATION  
 STEPHENS ELECTRONICS  
 STEPHENS ELECTRONICS  
 TELETRONIX  
 ULTRA AUDIO PRODUCTS  
 VISUAL ELECTRONICS CORP  
 WARD ELECTRONIC INDUSTRIES

**CONSOLE, AUDIO, RECORDING**

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 AMERICAN ELITE  
 AMPEX CORPORATION  
 ANCHA ELECTRONICS  
 ASCO SONOCRAFT CORP  
 BAUER ELECTRONICS CORPORATION  
 CCA ELECTRONICS CORPORATION  
 DATA INSTRUMENT DIVISION  
 FAIRCHILD RECORDING EQUIPMENT  
 GATES RADIO COMPANY  
 G E VISUAL COMMUNICATIONS PROD  
 GOTHAM AUDIO CORPORATION  
 HARVEY RADIO CO. INC.  
 HOUSTON ELECTRONICS CO.  
 IMPEX ELECTRONICS CORP  
 LANG ELECTRONICS, INC  
 LITTLE JOE ENTERPRISES  
 MID AMERICA ELECTRONICS CORP  
 NORTH AMERICAN PHILIPS CO  
 ORBIT RADIO  
 RCA BROADCAST PRODS.  
 SINGER PRODUCTS CO  
 SOUTHWESTERN COMMUNICATIONS  
 SPARTA ELECTRONIC CORPORATION  
 STEPHENS ELECTRONICS  
 TELETRONIX  
 ULTRA AUDIO PRODUCTS  
 UNITED RADIO SUPPLY, INC  
 VISUAL ELECTRONICS CORP  
 WARD ELECTRONIC INDUSTRIES  
 WILKINSON ELECTRONICS, INC

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 ANCHA ELECTRONICS  
 BAUER ELECTRONICS CORPORATION  
 BLONDER-TONGUE LABORATORIES  
 CCA ELECTRONICS CORPORATION  
 CENTRAL DYNAMICS CORPORATION  
 COLLINS RADIO COMPANY  
 DATA INSTRUMENT DIVISION  
 FAIRCHILD RECORDING EQUIPMENT  
 GATES RADIO COMPANY  
 G E VISUAL COMMUNICATIONS PROD

GOTHAM AUDIO CORPORATION  
 HOUSTON ELECTRONICS CO.  
 INTERNATIONAL NUCLEAR CORP.  
 LAKE ELECTRONICS, INC.  
 LITTLE JOE ENTERPRISES  
 MARYLAND TELECOMMUNICATIONS  
 MID AMERICA ELECTRONICS CORP  
 ORBIT RADIO  
 RCA BROADCAST PRODS.  
 SARKES-TARZIAN  
 SINGER PRODUCTS CO.  
 SOUTHWESTERN COMMUNICATIONS  
 SPARTA ELECTRONIC CORPORATION  
 STANDARD ELECTRONICS CORP  
 STEPHENS ELECTRONICS  
 S. STERLING COMPANY  
 SYLVANIA-COMM. ELECTRONICS DIV  
 TELETRONIX  
 ULTRA AUDIO PRODUCTS  
 VISUAL ELECTRONICS CORP  
 WARD ELECTRONIC INDUSTRIES  
 WILKINSON ELECTRONICS, INC

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 BAUER ELECTRONICS CORPORATION  
 BUD RADIO, INC  
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 ENCLOSURE CORP  
 GATES RADIO COMPANY  
 GRINNAN FIXTURE COMPANY  
 LANG ELECTRONICS, INC  
 LITTLE JOE ENTERPRISES  
 RCA BROADCAST PRODS.  
 SINGER PRODUCTS CO.  
 SPARTA ELECTRONIC CORPORATION  
 TELEQUIP CORPORATION  
 TELEVISION UTILITIES CORP  
 VENT-RAK INCORPORATED

**CONSOLE, KITS**

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 BAUER ELECTRONICS CORPORATION  
 DATA INSTRUMENT DIVISION  
 FAIRCHILD RECORDING EQUIPMENT  
 GOTHAM AUDIO CORPORATION  
 TELEQUIP CORPORATION  
 TELEVISION UTILITIES CORP

**CONSOLE, VIDEO, PORTABLE**

ALMA ENGINEERING INC  
 AMPEX CORPORATION  
 AMPLIVISION CORPORATION  
 CENTRAL DYNAMICS CORPORATION  
 DATA INSTRUMENT DIVISION  
 RIKFR VIDEO INDUSTRIES  
 SARKES-TARZIAN  
 SONY CORPORATION OF AMERICA  
 S. STERLING COMPANY  
 SYLVANIA-COMM. ELECTRONICS DIV  
 TELEQUIP CORPORATION  
 TELEVISION UTILITIES CORP  
 WARD ELECTRONIC INDUSTRIES

**CONSOLE, VIDEO, STUDIO**

ALMA ENGINEERING INC  
 AMPEX CORPORATION  
 AMPLIVISION CORPORATION  
 CENTRAL DYNAMICS CORPORATION  
 DATA INSTRUMENT DIVISION  
 MARYLAND TELECOMMUNICATIONS  
 MID AMERICA ELECTRONICS CORP  
 RCA BROADCAST PRODS.  
 RIKFR VIDEO INDUSTRIES  
 SARKES-TARZIAN  
 SONY CORPORATION OF AMERICA  
 STANDARD ELECTRONICS CORP  
 S. STERLING COMPANY  
 SYLVANIA-COMM. ELECTRONICS DIV  
 TELEQUIP CORPORATION  
 TELEVISION UTILITIES CORP  
 VISUAL ELECTRONICS CORP  
 WARD ELECTRONIC INDUSTRIES

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 BIRNS & SAWYER  
 BLONDER-TONGUE LABORATORIES  
 GENERAL ELECTRIC CO  
 GIRRS MFG. AND RESEARCH CORP.  
 JERROLD ELECTRONICS CORP  
 KAHN RESEARCH LABORATORIES  
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 MINNESOTA MINING - 3 M  
 THE SINGER CO - METRICS DIV  
 STANDARD KOLLSMAN INDUSTRIES  
 THE TECHNICAL MATERIEL CORP

**COOLING UNITS, TUBE**

EIMAC DIVISION OF VARIAN

**COPYING EQUIPMENT**

MINNESOTA MINING - 3 M

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 SINGER PRODUCTS CO.  
 UNITED STATES PLASTIC ROPE

**CORDS, LACING**

BIRNBACH CO  
 G C ELECTRONICS COMPANY

**CORDS, PATCH**

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 APPLIED ELECTRO-MECHANICS

AUDIO ACCESSORIES  
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 D & B ELECTRONICS COMPANY  
 ELECTRONICS ESSENTIALS OF CCC  
 HOLLAND ELECTRONICS INC  
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 SARKES-TARZIAN  
 SINGER PRODUCTS CO.  
 SWITCHCRAFT, INC.  
 THE TECHNICAL MATERIEL CORP  
 TROMPFETER ELECTRONICS  
 VITRO ELECTRONICS

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 D & B ELECTRONICS COMPANY  
 ITT WIRE & CABLE DIVISION  
 SINGER PRODUCTS CO.  
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**CORES, TRANSFORMER AND COIL**

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 E F JOHNSON COMPANY  
 MICROLAR / FXR  
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 MULTIRONICS  
 NARDA MICROWAVE CORPORATION  
 RCA BROADCAST PRODS.  
 ROMDE & SCHWARZ SALES CO. -USA  
 SINGER PRODUCTS CO.  
 STANDARD ELECTRONICS CORP  
 WABER ELECTRONICS, INC.

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 ELECTRONIC RESEARCH COMPANY  
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 PIEZO CRYSTAL COMPANY  
 PRECISION PIEZO SERVICE  
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 TRW ELECTRONICS

**CUTTERS, DISC - SEE LATHES****DECALCOMANIAS**

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 G C ELECTRONICS COMPANY  
 MINNESOTA MINING - 3 M

**DEHUMIDIFIERS**

PALL TRINITY MICRO CORP

**DELAY DEVICES, AF**

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 S. HIMMELSTEIN AND CO.  
 SINGER PRODUCTS CO.  
 TAPECASTER ELECTRONICS  
 TREPAC CORPORATION OF AMERICA  
 UNITED TRANSFORMER COMPANY

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 CENTRAL DYNAMICS CORPORATION  
 GENERAL RADIO CO  
 JERROLD ELECTRONICS CORP  
 KAPPA NETWORKS, INC  
 MICROWAVE ASSOCIATES, INC.  
 PHELPS DODGE  
 RCA BROADCAST PRODS.  
 ROMDE & SCHWARZ SALES CO. -USA  
 UNITED TRANSFORMER COMPANY

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 AMPLIFIER CORP OF AMERICA  
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 HEWLETT-PACKARD CO.  
 JOA CARTRIDGE SERVICE  
 RCA BROADCAST PRODS.  
 ROBINS INDUSTRIES CORP.  
 SINGER PRODUCTS CO.  
 THE SOUND SCRIBER CORP.  
 SPARTA ELECTRONIC CORPORATION

**DEMAGNETIZERS, HEAD**

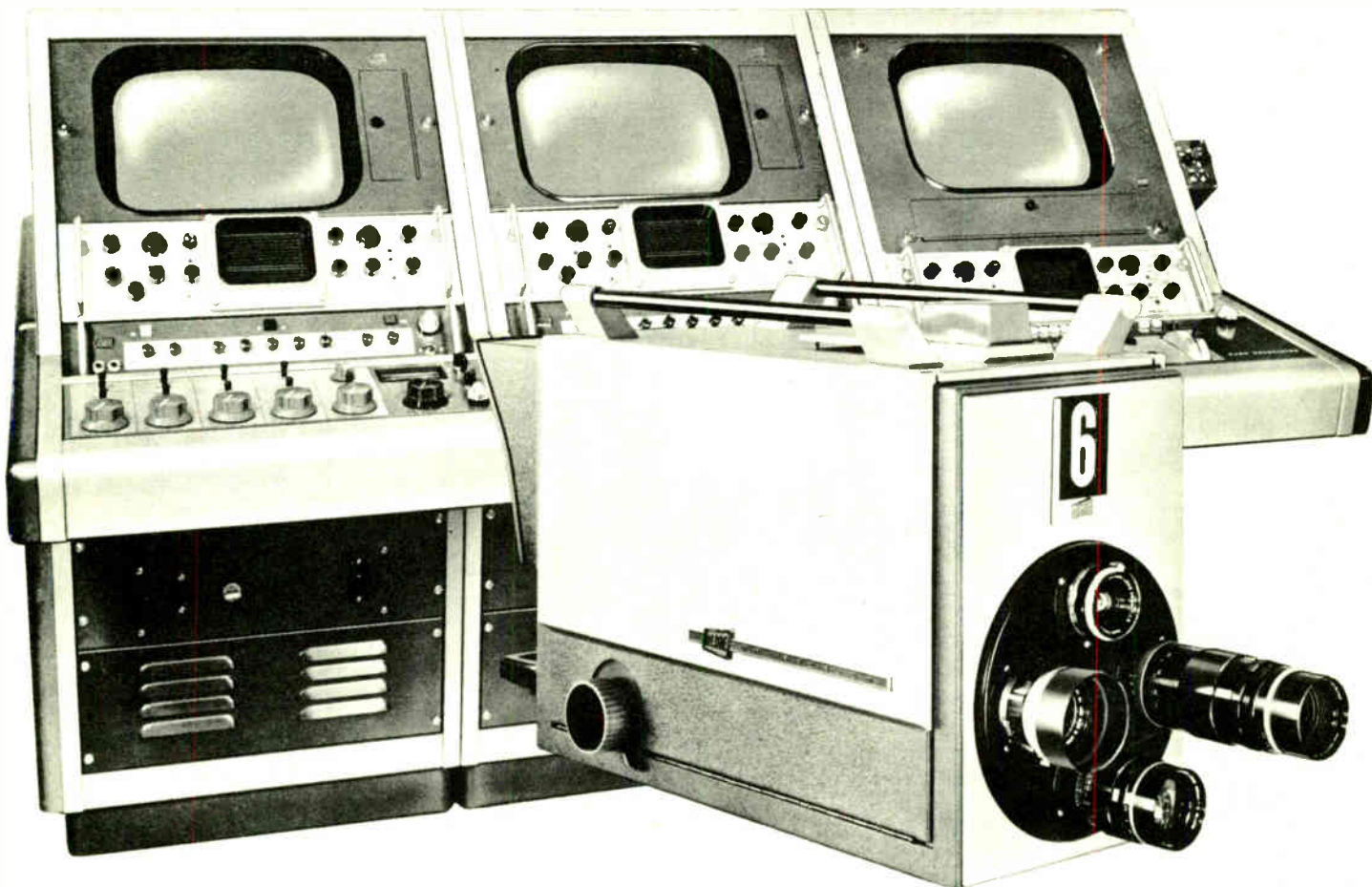
AMPEX CORPORATION  
 AMPLIFIER CORP OF AMERICA  
 AUDIO DEVICES  
 BROADCAST ELECTRONICS, INC  
 G C ELECTRONICS COMPANY  
 JOA CARTRIDGE SERVICE  
 RCA BROADCAST PRODS.  
 ROBINS INDUSTRIES CORP.  
 SPARTA ELECTRONIC CORPORATION

**DEMODULATORS**

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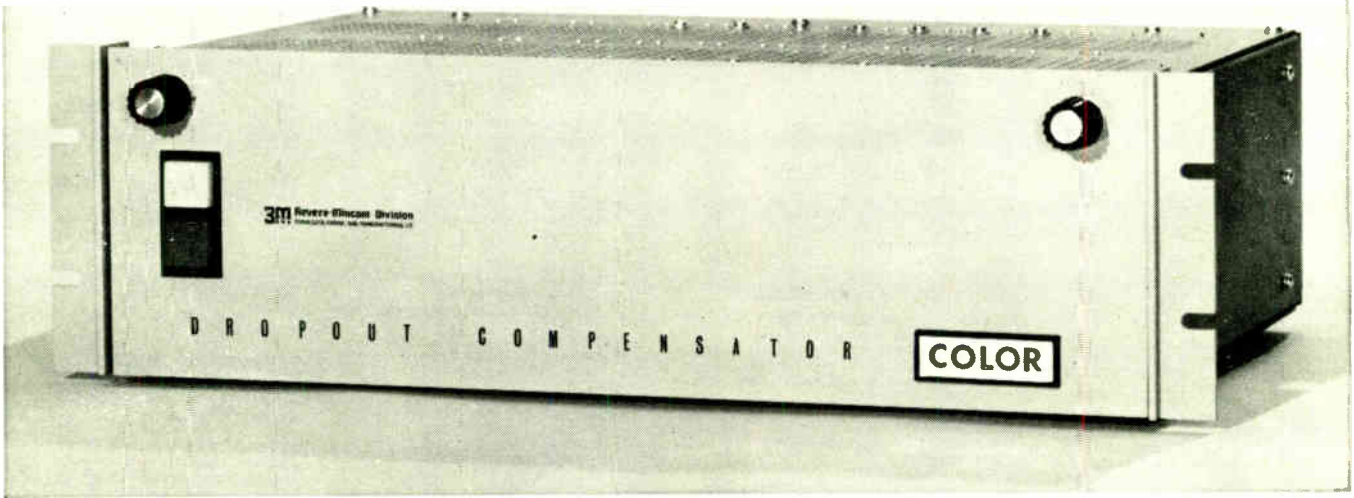
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INTERNATIONAL RECTIFIER  
SOLITRON DEVICES

#### HEATING ELEMENTS

GENERAL ELECTRIC CO

#### HOLDERS, CRYSTAL

E F JOHNSON COMPANY  
MICROLAB / FXR  
MICROWAVE ASSOCIATES, INC.

#### HOLDERS, FUSE

G C ELECTRONICS COMPANY  
LITTLE FUSE, INC.  
SINGER PRODUCTS CO.

#### HOUSINGS, ANTENNA

BENCO TELEVISION ASSOCIATES  
CCA ELECTRONICS CORPORATION  
GATES RADIO COMPANY

#### IMAGE MOTION

STABILIZATION SYSTEM  
DYNASCENCES CORPORATION

#### INDUCTANCES - ALSO SEE COILS

#### INDUCTANCES, FIXED

ADC PRODUCTS  
CCA ELECTRONICS CORPORATION  
GENERAL RADIO CO  
HEWLETT-PACKARD CO.  
E F JOHNSON COMPANY  
KAPPA NETWORKS, INC  
LAKE ELECTRONICS, INC.  
J. W. MILLER CO.  
MULTRONICS  
UNITED TRANSFORMER COMPANY

#### INDUCTANCES, VARIABLE

CCA ELECTRONICS CORPORATION  
DELTA ELECTRONICS INC  
GENERAL RADIO CO  
E F JOHNSON COMPANY  
KAPPA NETWORKS, INC  
J. W. MILLER CO.  
MULTRONICS  
UNITED TRANSFORMER COMPANY

#### INDUSTRIAL TV - ALSO SEE

##### TV, CLOSED CIRCUIT

AMPX CORPORATION  
ANACONDA ASTRODATA CO  
BALL BROTHERS RESEARCH  
BIDNIC INSTRUMENTS, INC.  
BLONDER-TONGUE LABORATORIES  
CENTRAL DYNAMICS CORPORATION  
COMU ELECTRONICS  
COLORADO VIDEO  
DAGE BELL CORPORATION  
DYNAIR ELECTRONICS, INC.  
GBC AMERICA CORPORATION  
G E VISUAL COMMUNICATIONS PROD  
GENERAL ELECTRIC CO  
ITI ELECTRONICS, INC.  
JERROLD ELECTRONICS CORP  
LAKE ELECTRONICS, INC.  
MARCONI DIVISION  
MARYLAND TELECOMMUNICATIONS  
MIRATEL ELECTRONICS, INC  
POWER-OPTICS INCORPORATED  
RCA BROADCAST PRODS.  
RIKER VIDEO INDUSTRIES  
SETCHELL CARLSON INCORPORATED  
SONY CORPORATION OF AMERICA  
S. STERLING COMPANY  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEMET COMPANY  
TELEQUIP CORPORATION  
TELEVISION UTILITIES CORP

#### INSULATORS, ANTENNA

ANTENNA PRODUCTS COMPANY  
BIRNBACH CO  
CENTRALAB  
G C ELECTRONICS COMPANY  
L F JOHNSON COMPANY  
UNITED STATES PLASTIC ROPE

#### INSULATORS, FEED THROUGH

BIRNBACH CO  
CENTRALAB  
G C ELECTRONICS COMPANY  
E F JOHNSON COMPANY

#### INSULATORS, STAND-OFF

ANTENNA PRODUCTS COMPANY  
BIRNBACH CO  
CENTRALAB  
G C ELECTRONICS COMPANY  
E F JOHNSON COMPANY

#### INSULATORS, OTHER

BIRNBACH CO  
BUCHANAN ELECTRICAL CORP  
CENTRALAB  
G C ELECTRONICS COMPANY  
E F JOHNSON COMPANY  
UTILITY TOWER CO.

#### INTEGRATED CIRCUITS

AEROVOX CORP  
AMERICAN ELITE  
CENTRALAB  
GENERAL ELECTRIC CO  
ITT CANNON ELECTRIC

MICROWAVE ASSOCIATES, INC.  
MOTOROLA SEMICONDUCTOR  
RCA ELECTRONIC COMPONENTS  
TEXAS INSTRUMENTS  
VITRO ELECTRONICS

#### INVERTERS, DC TO AC, CHOPPER

ALTEC LANSING  
GIBBS MFG. AND RESEARCH CORP.

#### INVERTERS, DC TO AC, SOLID STATE

ALTEC LANSING  
ELECTRO PRODUCTS LABORATORIES  
ITI ELECTRONICS, INC.  
POWER SOURCES  
SINGER PRODUCTS CO  
TEXAS ELECTRONICS  
TOPAZ INCORPORATED  
TREPAC CORPORATION OF AMERICA

#### INVERTERS, DC TO AC, VIBRATORS

ALTEC LANSING  
BIRNS & SAWYER  
CORNELL-DUBILIER ELECTRONICS  
SONY CORPORATION OF AMERICA

#### JACK PANEL ASSEMBLIES

ADC PRODUCTS  
AUDIO ACCESSORIES  
CENTRAL DYNAMICS CORPORATION  
COOKE ENGINEERING COMPANY  
D & B ELECTRONICS COMPANY  
ELECTRONICS ESSENTIALS OF CCC  
HOLLAND ELECTRONICS INC  
PHELPS DODGE  
RCA BROADCAST PRODS.  
SARKES-TARZIAN  
SINGER PRODUCTS CO.  
SOUTHWESTERN COMMUNICATIONS  
S. STERLING COMPANY  
SWITCHCRAFT, INC.  
THE TECHNICAL MATERIEL CORP  
TREPAC CORPORATION OF AMERICA  
TROMPETER ELECTRONICS  
VISUAL ELECTRONICS CORP  
VITRO ELECTRONICS

#### JACKS

ADC PRODUCTS  
AUDIO ACCESSORIES  
BIRNBACH CO  
CENTRAL DYNAMICS CORPORATION  
COOKE ENGINEERING COMPANY  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
GENERAL RADIO CO  
E F JOHNSON COMPANY  
MALLORY DISTRIBUTOR PRODUCTS  
PHELPS DODGE  
ROBINS INDUSTRIES CORP.  
SINGER PRODUCTS CO.  
SWITCHCRAFT, INC.  
THE TECHNICAL MATERIEL CORP  
THOMSON ELECTRIC CO  
TROMPETER ELECTRONICS  
VISUAL ELECTRONICS CORP  
VITRO ELECTRONICS

#### JOINTS, ROTARY, COAXIAL

ANDREW CORPORATION  
GENERAL RADIO CO  
MICRO-LINK SYSTEMS/VARIAN ASSO  
SCIENTIFIC-ATLANTA

#### JOINTS, ROTARY, WAVEGUIDE

ANDREW CORPORATION  
DEMORNY - BONARDI DIVISION  
MICRO-LINK SYSTEMS/VARIAN ASSO  
MICROWAVE ASSOCIATES, INC.

#### KITS

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ALLIED ELECTRONICS CORP  
HEATH CO  
UPSON BROS.  
WABER ELECTRONICS, INC.

#### KNOBS

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G C ELECTRONICS COMPANY  
GENERAL RADIO CO  
MALLORY DISTRIBUTOR PRODUCTS  
OHMITE MANUFACTURING COMPANY  
PAINONT INCORPORATED  
SINGER PRODUCTS CO.  
TELEQUIP CORPORATION  
TELETRONIX

#### LAMP ASSEMBLIES

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D & B ELECTRONICS COMPANY  
DIALIGHT CORPORATION  
ELECTRONICS ESSENTIALS OF CCC  
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HUGHEY & PHILLIPS  
INDUSTRIAL DEVICES, INC.  
ROBINS INDUSTRIES CORP.  
VENT-RAK INCORPORATED

#### LAMPS, ARC

ENGINEERING ASSOCIATES  
MOLE-RICHARDSON CO.

#### LAMPS, EXCITER

G E DISTRIBUTOR SALES FORCE

#### LAMPS, GLOW

DIALIGHT CORPORATION  
G E DISTRIBUTOR SALES FORCE  
INDUSTRIAL DEVICES, INC.  
MOLE-RICHARDSON CO.

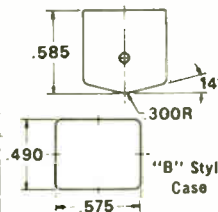
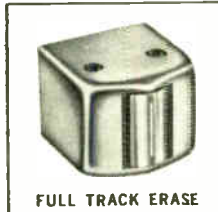
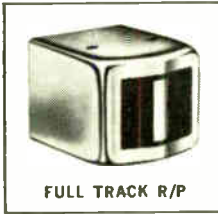
#### LAMPS, PANEL

ADC PRODUCTS  
AUDIO ACCESSORIES





**FOR PROFESSIONAL REEL-TO-REEL MACHINES**



**Head Mounting Brackets for Professional Machines**

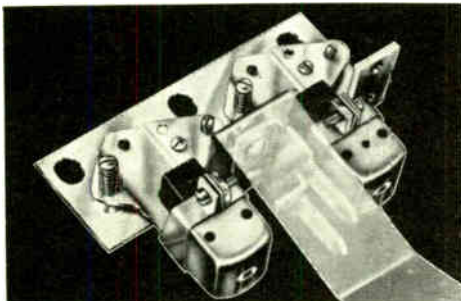


**QK-76 with Nortronics Head original Ampex equipment... Net Each \$12.00**

QK-76 contains all hardware and illustrated instructions necessary to adapt a Nortronics head to the shield cup of an Ampex head nest. Includes: precision cast aluminum block; spacers; screws; connector plug—all other parts necessary are utilized from the

**QK-35** is a special base-mount bracket kit for adapting Nortronics no-mount heads for replacement of Brush heads, or in any application requiring a large base-mounting stud. (Stud is 1/4" - 28 x 3/8")... Net Each **\$2.00**

**FOR CARTRIDGE MACHINES**



**YOUR LOCAL DISTRIBUTOR STOCKS THE FULL LINE OF NORTRONICS TAPE HEADS AND ACCESSORIES**

**QUICK-KITS** (Head Mounting Assemblies)—Tape Guides—Alignment Tape—Connector Assemblies—Bias Oscillator Transformers—Replacement Heads for over 1500 models... Consult your distributor for full information.

| Manufacturer and Model Numbers   | Original Function                          | Nortronics Head + Quik-Kit           | Net,† Less Quik-Kit |       |
|--|--|--------------------------------------|---------------------|-------|
| <b>AMPEX</b><br>300, 350, 354, 400 Series<br><br>NOTE: On PR-10, 600, 900 and 1200 Series, use QK-66 instead of QK-76. | Record, Full Track                         | 8001 + 76                            | \$36.00             |       |
|  | Play, Full Track                           | 8000 + 76                            | 36.00               |       |
|  | Erase, Full Track (for all but 300 series) | 8109 + 76                            | 30.00               |       |
|  | Erase, Full Track (for 300 series only)    | 8106 + 76                            | 30.00               |       |
|  | Record Mono, 2-Track                       | 8401 + 76                            | 22.00               |       |
|  | Play Mono, 2-Track                         | 8400 + 76                            | 22.00               |       |
|  | Erase Mono, 2-Track                        | 8504 + 76                            | 18.00               |       |
|  | Record Stereo, 2-Track                     | 8201 + 76                            | 32.00               |       |
|  | Play Stereo, 2-Track                       | 8200 + 76                            | 32.00               |       |
|  | Erase Stereo, 2-Track                      | 8304 + 76                            | 26.00               |       |
|  | Record Stereo, 4-Track                     | 8604 + 76                            | 30.00               |       |
|  | Play Stereo, 4-Track                       | 8600 + 76                            | 30.00               |       |
|  | Erase Stereo, 4-Track                      | 8701 + 76                            | 26.00               |       |
|  | 3200                                       | Record, Full Track                   | 8004 + 76           | 40.00 |
|  |  | Play, Full Track                     | 8008 + 76           | 36.00 |
| Record Stereo, 2-Track   |  | 8214 + 76                            | 32.00               |       |
| Play Stereo, 2-Track   |  | 8210 + 76                            | 32.00               |       |
| Record Stereo, 4-Track   |  | 8614 + 76                            | 30.00               |       |
| Play Stereo, 4-Track   |  | 8610 + 76                            | 30.00               |       |
| Record Mono, 2-Track   |  | 8414 + 76                            | 22.00               |       |
| Play Mono, 2-Track   |  | 8402 + 76                            | 22.00               |       |
| <b>CROWN</b><br>701, 801, BX801, 1001, 1401  |  | Play only or Record/Play, Full Track | 8006 + 35           | 36.00 |
|  |  | Record, Full Track                   | 8001 + 35           | 36.00 |
|  | Erase, Full Track                          | 8102 + 35                            | 30.00               |       |
| 712, 822, BX822, 1022, 1422/8  | Play only or Record/Play Stereo, 2-Track   | 8209 + 35                            | 32.00               |       |
| Record Stereo, 2-Track   | 8201 + 35                                  | 32.00                                |                     |       |
| Erase Stereo, 2-Track  | 8304 + 38                                  | 26.00                                |                     |       |
| 702, 802, BX802, 1002, 1402/8  | Play only or Record/Play Mono, 2-Track     | 8403 + 35                            | 22.00               |       |
|  | Record Mono, 2-Track                       | 8404 + 35                            | 22.00               |       |
|  | Erase Mono, 2-Track                        | 8504 + 38                            | 18.00               |       |
| A51, A314  | Play only Mono, 2-Track                    | 8406 + 66                            | 22.00               |       |
| A54, A324  | Play only Stereo, 4-Track                  | 8608 + 66                            | 30.00               |       |
| 714C, 824, BX824, 1024, 1424   | Play only or Record/Play Stereo, 4-Track   | 8608 + 66                            | 30.00               |       |
|  | Record Stereo, 4-Track                     | 8608 + 66                            | 30.00               |       |
|  | Erase Stereo, 4-Track                      | 8701 + 38                            | 26.00               |       |
| <b>MAGNECORD</b><br>1021<br>*No QK required  | Record, Full Track                         | 8005 *                               | 40.00               |       |
|  | Play Mono, 2-Track                         | 8408 *                               | 22.00               |       |
|  | Erase, Full Track                          | 8102 *                               | 30.00               |       |
|  | Play, Full Track (Optional)                | 8006 *                               | 36.00               |       |
| 1022<br>*No QK required  | Record Stereo, 2-Track                     | 8203 *                               | 35.00               |       |
|  | Play Stereo, 2-Track                       | 8202 *                               | 35.00               |       |
|  | Erase Stereo, 2-Track                      | 8302 *                               | 26.00               |       |
| 1024<br>*No QK required  | Record Stereo, 4-Track                     | 8602 *                               | 30.00               |       |
|  | Play Stereo, 4-Track                       | 8607 *                               | 30.00               |       |
|  | Erase Stereo, 4-Track                      | 8702 *                               | 26.00               |       |
| P60, P75, M90<br>*No QK required   | Record, Full Track                         | 8001 + 35                            | 36.00               |       |
|  | Play, Full Track                           | 8000 + 35                            | 36.00               |       |
|  | Erase, Full Track                          | 8105 + 35                            | 30.00               |       |
| <b>R.C.A.</b><br>RT21<br>*No QK required   | Record, Full Track                         | 8002 *                               | 68.00               |       |
|  | Play, Full Track                           | 8003 *                               | 54.00               |       |
|  | Erase, Full Track                          | 8110 *                               | 68.00               |       |
|  | Record Stereo, 2-Track                     | 8206 *                               | 42.00               |       |
|  | Play Stereo, 2-Track                       | 8205 *                               | 54.00               |       |
|  | Erase Stereo, 2-Track                      | 8307 *                               | 48.00               |       |

**NO-MOUNT and REAR-MOUNT HEADS FOR ATC, Collins, Gates, KRS, Macarta, RCA, Sparta, Tapecaster**

FOR REPLACEMENT OR NAB CONVERSION. FULL LISTINGS IN NORTRONICS BULLETIN 7230A. SEND FOR YOUR COPY.

**No-Mount Head Bracket Assembly for Cartridge Machines**

**QK-114** installs two no-mount dual channel heads for monophonic use, or two no-mount three channel heads for stereo operation. Left head is for recording; right head for playback. Requires heads similar to 2000 Series. Completely assembled and semi-aligned... Net Each **\$13.60**

**QK-115** installs two no-mount monophonic 2-track heads (see monitor conversion information below). Requires heads similar to 3000 Series. Completely assembled and semi-aligned... Net Each **\$13.60**

BOTH QK-114 AND QK-115 FURNISHED WITH CARTRIDGE HOLD-DOWN SPRING AND CARTRIDGE GUIDE RAIL.

**NAB CONVERSION TO MONITOR**—As all professional users of tape equipment know, superior results can be achieved by using a special record-only head plus a separate playback head. Professionals also appreciate the ability to be able to monitor a tape as it is being recorded. Nortronics offers a conversion to monitor operation to update cartridge machines.

**NORTRONICS COMPANY, INC.**

8101 Tenth Avenue North • Minneapolis, Minnesota 55427 • Phone: (612) 545-0401

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FAIRCHILD RECORDING EQUIPMENT  
GOTHAM AUDIO CORPORATION  
KOSSE ELECTRONICS, INC.  
SCULLY RECORDING INSTRUMENTS  
SINGER PRODUCTS CO  
SOUTHWESTERN COMMUNICATIONS

LEADER, FILM  
PRD-TEX REEL BAND COMPANY

LEADS, TEST  
ELECTRONICS ESSENTIALS OF CCC  
E-2-HOOK TEST PRODUCTS  
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LENSES, OPTICAL, FIXED  
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SYLVANIA-COMM. ELECTRONICS DIV  
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TELEVISION UTILITIES CORP  
TRAIT CORPORATION  
VISUAL ELECTRONICS CORP  
ZOOMATICS CORPORATION  
ZOOMAR, INC.

LENSES, OPTICAL, ZOOM  
ALBION OPTICAL COMPANY  
AMECO, INC.  
AMPEX CORPORATION  
BIRNS & SAWYER  
BURKE & JAMES  
COMU ELECTRONICS  
LAKE ELECTRONICS, INC.  
MINNESOTA MINING - 3 M  
POWER-OPTICS INCORPORATED  
RCA BROADCAST PRODS.  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEMATIION, INC.  
TELEQUIP CORPORATION  
TELEVISION UTILITIES CORP  
TELEVISION ZOOMAR  
TRAIT CORPORATION  
VISUAL ELECTRONICS CORP  
ZOOMATICS CORPORATION  
ZOOMAR, INC.

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PRESSURE SENSITIVE  
W H BRADY CO.

LIFTS, AERIAL, TRUCK MOUNTED  
HUNT-PIERCE CORP  
TELSTA CORPORATION

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LIGHTING & ELECTRONICS, INC.  
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MOLE-RICHARDSON CO.  
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RCA BROADCAST PRODS.  
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TELEVISION UTILITIES CORP  
VISUAL ELECTRONICS CORP

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COLORTRAN INDUSTRIES - BERKEY  
HOUSTON ELECTRONICS CO.  
LIGHTING & ELECTRONICS, INC.  
METROPOLITAN ELECTRIC MFG CO  
MOLE-RICHARDSON CO.  
RCA BROADCAST PRODS.  
TELEQUIP CORPORATION  
TELEVISION UTILITIES CORP  
VISUAL ELECTRONICS CORP

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ELECTRONIC LIGHTS, INC.  
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MOLE-RICHARDSON CO.  
PACIFIC TOWER CO  
RCA BROADCAST PRODS.  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEQUIP CORPORATION  
TELEVISION UTILITIES CORP  
VISUAL ELECTRONICS CORP

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CONTINENTAL ELECTRONICS MFG  
G C ELECTRONICS COMPANY  
GENERAL ELECTRIC CO

MOLE-RICHARDSON CO.  
TELEVISION UTILITIES CORP  
UP-RIGHT SCAFFOLDS

LIGHTS, TOWER, OBSTRUCTION  
ROHN MANUFACTURING CO.

LIMITERS - SEE AMPLIFIERS

LOG BOOKS OR SHEETS  
ACME VISIBLE RECORDS  
ROBINS INDUSTRIES CORP.

LOUVRES, VENTILATING -  
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LUBRICANTS  
G C ELECTRONICS COMPANY

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ORBIT RADIO  
RCA SERVICE COMPANY  
SOUTHWESTERN COMMUNICATIONS

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CARTRIDGE TAPE  
JOA CARTRIDGE SERVICE

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CCA ELECTRONICS CORPORATION  
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EITEL ELECTRONICS  
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ORBIT RADIO  
RCA SERVICE COMPANY  
SOUTHWESTERN COMMUNICATIONS  
STANDARO ELECTRONICS CORP.

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AMECO, INC.  
AMERICAN ELECTRONIC LABS  
EITEL ELECTRONICS  
LIBERTY TOWER MFG. CO  
RCA SERVICE COMPANY

MAINTENANCE SERVICES,  
STEEPLE JACK  
LIBERTY TOWER MFG. CO  
LITTLE JOE ENTERPRISES  
RCA SERVICE COMPANY  
SWAGER TOWER CORPORATION  
TRYLON INCORPORATED  
UTILITY TOWER CO.

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CENTRAL DYNAMICS CORPORATION  
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THE JAMES FLOYD FORD CO  
RCA SERVICE COMPANY  
SARKES-TARZIAN  
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TELEVISION UTILITIES CORP  
TOWNSEND ASSOCIATES

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API INSTRUMENTS CO.  
C B S LABORATORIES  
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GOTHAM AUDIO CORPORATION  
MCMARTIN INDUSTRIES  
NORTHEAST ELECTRONICS CORP  
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RDBINS INDUSTRIES CORP.  
TRIPLETT ELECTRICAL INSTRUMENT  
YOKOGAWA ELECTRIC WORKS

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WILKINSON ELECTRONICS, INC  
YOKOGAWA ELECTRIC WORKS

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ALBION OPTICAL COMPANY  
AMPLIFIER CORP OF AMERICA  
GOTHAM AUDIO CORPORATION  
MCOM, INC

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BELAR ELECTRONICS LABORATORY  
BLONDER-TONGUE LABORATORIES  
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HICKOK ELECTRICAL INSTRUMENT  
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NARDA MICROWAVE CORPORATION  
RCA BROADCAST PRODS.  
ROHDE & SCHWARZ SALES CO. -USA  
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WATERS MANUFACTURING  
WAVEFORMS, INCORPORATED  
YOKOGAWA ELECTRIC WORKS

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HEWLETT-PACKARD CO.  
MICROLAB / FXR  
NARDA MICROWAVE CORPORATION  
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TV CABLE SUPPLY CO

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BURKE & JAMES  
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GAMMA SCIENTIFIC, INC.  
G E SUPPLY COMPANY  
YOKOGAWA ELECTRIC WORKS  
ZOOMAR, INC.

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HICKOK ELECTRICAL INSTRUMENT  
ROHDE & SCHWARZ SALES CO. -USA  
THE SINGER CO - METRICS DIV  
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CCA ELECTRONICS CORPORATION  
ENGINEERING ASSOCIATES  
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HEWLETT-PACKARD CO.  
MARCONI INSTRUMENTS  
NARDA MICROWAVE CORPORATION  
ROHDE & SCHWARZ SALES CO. -USA  
THE SINGER CO - METRICS DIV  
YOKOGAWA ELECTRIC WORKS

METERS, STANDING WAVE  
BIRD ELECTRONIC CORPORATION  
DELTA ELECTRONICS INC  
DEMORNAY - BONARDI DIVISION  
ENGINEERING ASSOCIATES  
GENERAL MICROWAVE CORPORATION  
HEWLETT-PACKARD CO.  
NARDA MICROWAVE CORPORATION  
ROHDE & SCHWARZ SALES CO. -USA  
STANDARO ELECTRONICS CORP.  
THE TECHNICAL MATERIEL CORP

METERS - SEE SPECIFIC TYPE  
API INSTRUMENTS CO.  
COMU ELECTRONICS  
HEWLETT-PACKARD CO.  
HICKOK ELECTRICAL INSTRUMENT  
LAMPKIN LABORATORIES INC  
MCMARTIN INDUSTRIES  
THE SINGER CO - METRICS DIV

MICROPHONE HARDWARE  
ALTEC LANSING  
AMECO, INC.  
AMERICAN GELDSO ELECTRONICS  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
GOTHAM AUDIO CORPORATION  
NORTH AMERICAN PHILIPS CO  
RCA BROADCAST PRODS.  
RCA ELECTRONIC COMPONENTS  
ROBINS INDUSTRIES CORP.  
SHURE BROTHERS, INC.  
SYLVANIA-COMM. ELECTRONICS DIV  
TRUSONIC  
TURNER MICROPHONE CO  
VISUAL ELECTRONICS CORP

MICROPHONE STANDS & BOOMS  
ALTEC LANSING  
AMERICAN GELSO ELECTRONICS  
THE ASTATIC CORPORATION  
E J BAUGHMAN CO  
CENTURY LIGHTING, INC.  
G C ELECTRONICS COMPANY  
GOTHAM AUDIO CORPORATION  
HOUSTON FEARLESS CORPORATION  
MOLE-RICHARDSON CO.  
NORTH AMERICAN PHILIPS CO  
RCA BROADCAST PRODS.  
RCA ELECTRONIC COMPONENTS  
SHURE BROTHERS, INC.  
SINGER PRODUCTS CO.  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEVISION UTILITIES CORP  
TURNER MICROPHONE CO  
VISUAL ELECTRONICS CORP

MICROPHONES, CONDENSER  
ALTEC LANSING  
AMERICAN ELITE  
GOTHAM AUDIO CORPORATION  
NORTH AMERICAN PHILIPS CO  
RCA ELECTRONIC COMPONENTS  
SINGER PRODUCTS CO.  
SONY CORPORATION OF AMERICA  
SPARTA ELECTRONIC CORPORATION  
SYNCRON CORPORATION  
TRUSONIC  
VEGA ELECTRONICS CORPORATION  
VISUAL ELECTRONICS CORP

MICROPHONES, DYNAMIC  
ALTEC LANSING  
AMERICAN ELITE  
AMERICAN GELSO ELECTRONICS

AMPEX CORPORATION  
THE ASTATIC CORPORATION  
CALIFONE/ROBERTS  
ELECTRO-VOICE INC  
GATES RADIO COMPANY  
G C ELECTRONICS COMPANY  
MCMARTIN INDUSTRIES  
MILES REPRODUCER CO  
NORTH AMERICAN PHILIPS CO  
PERMOFLUX CORPORATION  
RCA BROADCAST PRODS.  
RCA ELECTRONIC COMPONENTS  
ROBINS INDUSTRIES CORP.  
SHURE BROTHERS, INC.  
SINGER PRODUCTS CO.  
SONY CORPORATION OF AMERICA  
SPARTA ELECTRONIC CORPORATION  
SYLVANIA-COMM. ELECTRONICS DIV  
TURNER MICROPHONE CO  
VISUAL ELECTRONICS CORP

MICROPHONES, VELOCITY  
RCA BROADCAST PRODS.  
RCA ELECTRONIC COMPONENTS  
SINGER PRODUCTS CO.  
VISUAL ELECTRONICS CORP

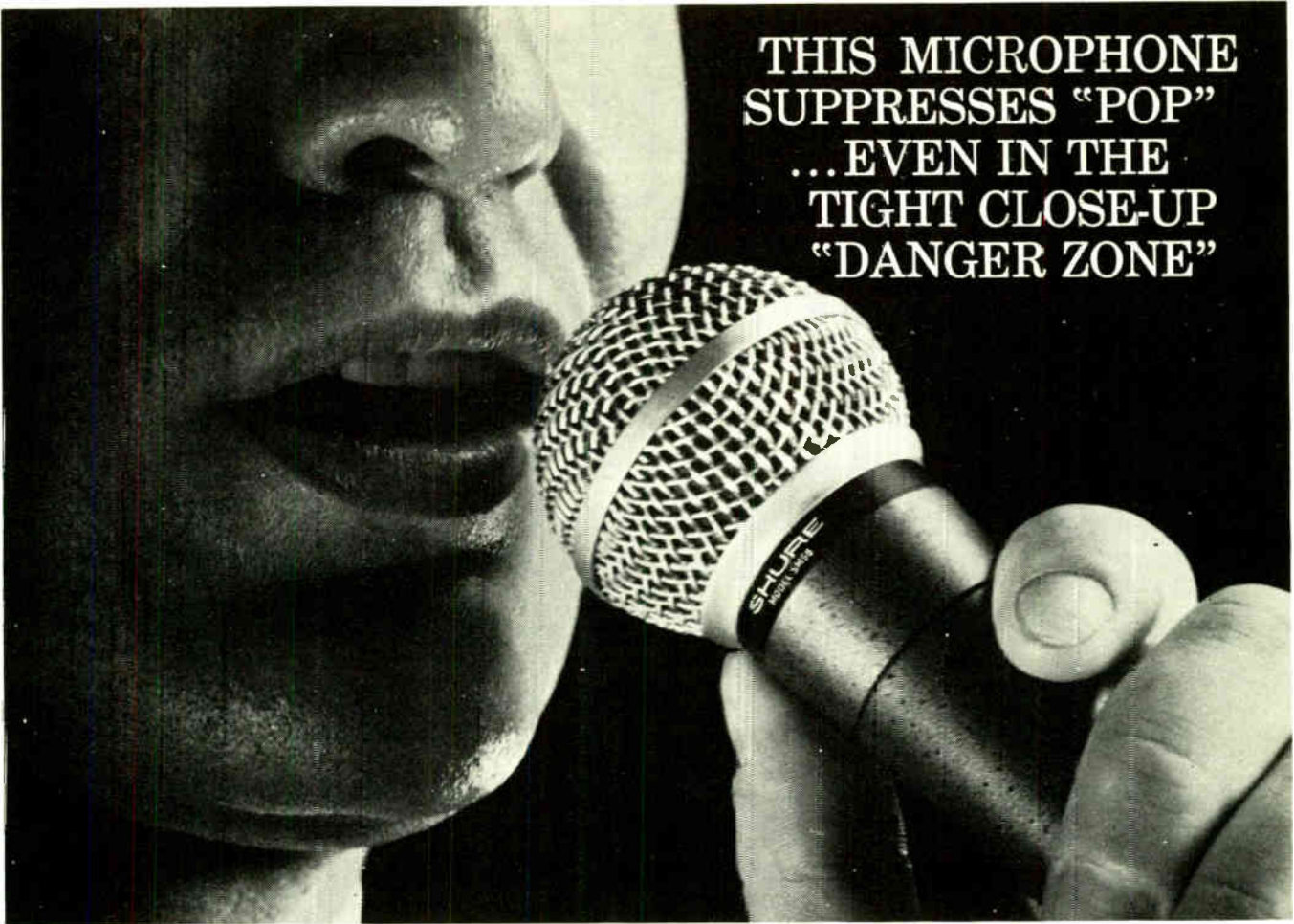
MICROPHONES, WIRELESS  
AMERICAN GELSO ELECTRONICS  
MILES REPRODUCER CO  
SINGER PRODUCTS CO  
SONY CORPORATION OF AMERICA  
SPARTA ELECTRONIC CORPORATION  
TRUSONIC  
VEGA ELECTRONICS CORPORATION  
VISUAL ELECTRONICS CORP

MICROWAVE COMPONENTS  
ALFORD MANUFACTURING COMPANY  
AMECO, INC.  
AMERICAN ELITE  
AMPEX ELECTRONIC CORP  
ANDREW CORPORATION  
BIRD ELECTRONIC CORPORATION  
CARDWELL CONDENSER CORP  
DEMORNAY - BONARDI DIVISION  
EIMAC DIVISION OF VARIAN  
ENGINEERING ASSOCIATES  
ELECTRONICS ESSENTIALS OF CCC  
GENERAL ELECTRIC CO  
GENERAL RADIO CO  
HEWLETT-PACKARD CO.  
JERROLD ELECTRONICS CORP  
LITTON EDUCATIONAL TELE DIV  
MICROLAB / FXR  
MICRO-LINK SYSTEMS/VARIAN ASSO  
MICROWAVE ASSOCIATES, INC.  
MOTOROLA SEMICONDUCTOR  
NARDA MICROWAVE CORPORATION  
PHELPS DODGE  
PRODELIN, INCORPORATED  
RAYTHEON CO EQUIPMENT DIVISION  
RCA BROADCAST PRODS.  
RMG ELECTRONICS LABORATORY  
ROHDE & SCHWARZ SALES CO. -USA  
SCIENTIFIC-ATLANTA  
SOLITRON DEVICES  
SYLVANIA-SEMICONDUCTOR DIV.  
TEXAS INSTRUMENTS

MICROWAVE SYSTEMS, STL  
AMECO, INC.  
COLLINS RADIO COMPANY  
DEMORNAY - BONARDI DIVISION  
F & M SYSTEMS COMPANY  
JERROLD ELECTRONICS CORP  
LENKURT ELECTRIC CO., INC.  
LITTON EDUCATIONAL TELE DIV  
MARTI ELECTRONICS  
MICROLAB / FXR  
MICRO-LINK SYSTEMS/VARIAN ASSO  
MICROWAVE ASSOCIATES, INC.  
MOSELEY ASSOCIATES, INC.  
PRODELIN, INCORPORATED  
RAYTHEON CO EQUIPMENT DIVISION  
RCA BROADCAST PRODS.  
RMG ELECTRONICS LABORATORY  
SARKES-TARZIAN  
SINGER PRODUCTS CO  
TELETRONIX  
VISUAL ELECTRONICS CORP

MICROWAVE SYSTEMS, 2500 MHZ  
AMERICAN ELITE  
DEMORNAY - BONARDI DIVISION  
EMCEE  
F & M SYSTEMS COMPANY  
ITT TELECOMMUNICATIONS  
JERROLD ELECTRONICS CORP  
LITTON EDUCATIONAL TELE DIV  
MICROLAB / FXR  
MICRO-LINK SYSTEMS/VARIAN ASSO  
PRODELIN, INCORPORATED  
RAYTHEON CO EQUIPMENT DIVISION  
RCA BROADCAST PRODS.  
RMG ELECTRONICS LABORATORY

MICROWAVE SYSTEMS, OTHER  
CARDWELL CONDENSER CORP  
EMCEE  
F & M SYSTEMS COMPANY  
JERROLD ELECTRONICS CORP  
MICROLAB / FXR  
MICRO-LINK SYSTEMS/VARIAN ASSO  
MICROWAVE ASSOCIATES, INC.  
NARDA MICROWAVE CORPORATION  
RAYTHEON CO EQUIPMENT DIVISION  
RCA BROADCAST PRODS.  
RMG ELECTRONICS LABORATORY  
MIXERS - ALSO SEE CONSOLES  
AMERICAN GELSO ELECTRONICS  
BAUER ELECTRONICS CORPORATION  
BIRNS & SAWYER  
BLONDER-TONGUE LABORATORIES  
CENTRAL DYNAMICS CORPORATION



**THIS MICROPHONE  
SUPPRESSES "POP"  
...EVEN IN THE  
TIGHT CLOSE-UP  
"DANGER ZONE"**

The Shure SM58 self-windscreened unidirectional microphone is ideal for broadcast uses such as remote news, sports, interview and vocal recordings because it eliminates or minimizes the irritating "pop" caused by explosive breath sounds. With the SM58 you will have the peace-of-mind assurance that you're delivering the quality audio that goes with pop-free pickup. It's great for studio announcing, too—or wherever the announcer or vocalist has the audio-degrading habit of "mouthing" the microphone. Of course, the same filters that eliminate pop also do away with the necessity for an add-on windscreen in outdoor uses.

On the other hand, the unusually effective unidirectional cardioid pickup pattern (uniform at all frequencies, in all planes) means that it is a real problem-solver where background noise is high or where the microphone must be operated at some distance from the performer. Incidentally,

but very important, the SM58 tends to control the low frequency "boominess" that is usually accented by close-up microphones.

All in all, close up or at a distance, the Shure SM58 solves the kind of ever-present perplexing problems the audio engineer may have felt were necessary evils. The SM58 might well be the finest all-purpose hand-held microphone in manufacture today. And, all things considered, it is moderate in cost.

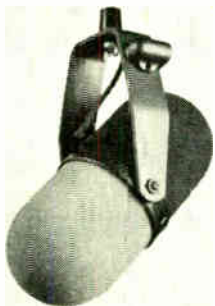
Other features: the complete pop-proof filter assembly is instantly replaceable in the field, without tools. Filters can be easily cleaned, too. Stand or hand operation. Detachable cable. Rubber-mounted cartridge minimizes handling noise. Special TV-tested non-glare finish.

For additional information, write directly to Mr. Robert Carr, Manager of Professional Products Division, Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Illinois 60204.

## SHURE SM58

SELF-WINDSCREENED UNIDIRECTIONAL DYNAMIC MICROPHONE

OTHER SHURE PROFESSIONAL MICROPHONES... FOR SUPERIOR AUDIO



**MODEL SM5  
CARDIOID BOOM DYNAMIC**

Because its cardioid directional pattern is uniquely uniform with frequency and symmetrical about its axis, the SM5 is singularly independent of the effects of environment. Even in extreme shooting situations (such as with tight sets, low ceilings, hard walls, low microphone angles, traffic or air-conditioner noise and rumble and changing distance) the SM5 minimizes sound coloration and ambient noise pickup.



**MODEL SM76  
3/4" OMNIDIRECTIONAL  
DYNAMIC**

Ideal for interviews and audience participation, yet unusually smooth wide range response (40-20 KC) for critical music reproduction. Instantly detachable from stand. Steel case with Cannon connector.



**MODEL SM50  
OMNIDIRECTIONAL  
DYNAMIC**

Self-windscreened and pop-free for news, sports, remotes, and interviews. Also ideal for many studio and control room applications. Comfortably balanced for hand or stand use. Natural response.

FAIRCHILD RECORDING EQUIPMENT  
GOTHAM AUDIO CORPORATION  
HARVEY RADIO CO. INC.  
HOUSTON ELECTRONICS CO.  
LANG ELECTRONICS, INC.  
MICROLAB / FXR  
NORTH AMERICAN PHILIPS CO  
ORBIT RADIO  
RCA BROADCAST PRODS.  
SHURE BROTHERS, INC.  
SINGER PRODUCTS CO  
SOUNDCRAFT INDUSTRIES  
SOUTHWESTERN COMMUNICATIONS  
SPARTA ELECTRONIC CORPORATION

MOBILE EQUIPMENT

AMERICAN ELITE  
AMERICAN GELOSIO ELECTRONICS  
AMPEX CORPORATION  
ANDREW CORPORATION  
ATLAS SOUND  
CENTRAL DYNAMICS CORPORATION  
COURIER COMMUNICATIONS  
F & M SYSTEMS COMPANY  
GATES RADIO COMPANY  
G E COMMUNICATION PRODUCTS  
J M ELECTRONICS COMPANY  
E F JOHNSON COMPANY  
MARTI ELECTRONICS  
MICROWAVE ASSOCIATES, INC.  
MOSELEY ASSOCIATES INC.  
THE NOVA COMPANY  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO  
SYLVANIA-COMM. ELECTRONICS DIV  
UTICA CORPORATION  
H. WILSON CORPORATION

MOBILE EQUIPMENT, TV

ELECTRONIC MOBILE UNITS  
TELE - DEVICES CO.

MODULATORS, TV

AMECO, INC.  
BLONDER-TONGUE LABORATORIES  
CATEL COMPANY  
DYNATR ELECTRONICS, INC.  
EMCEE  
INTERNATIONAL NUCLEAR CORP.  
JERROLD ELECTRONICS CORP  
MARCONI DIVISION  
ROHDE & SCHWARZ SALES CO. -USA  
STANDARD ELECTRONICS CORP.  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEQUIP CORPORATION  
TOWNSEND ASSOCIATES

MONITORS, AM SYSTEMS

ALTEC LANSING  
BELAR ELECTRONICS LABORATORY  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
G E VISUAL COMMUNICATIONS PROO  
MELCOR ELECTRONICS  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO  
SOUTHWESTERN COMMUNICATIONS  
TREPAC CORPORATION OF AMERICA  
VISUAL ELECTRONICS CORP  
VITRO ELECTRONICS  
WILKINSON ELECTRONICS, INC

MONITORS, FM SYSTEMS, MONO

ALTEC LANSING  
AMECO, INC.  
BELAR ELECTRONICS LABORATORY  
BROWNING LABORATORIES, INC.  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
HEWLETT-PACKARD CO.  
KARG LABORATORIES  
MCMARTIN INDUSTRIES  
MELCOR ELECTRONICS  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO.  
SOUTHWESTERN COMMUNICATIONS  
UTICA CORPORATION  
VISUAL ELECTRONICS CORP  
VITRO ELECTRONICS

MONITORS, FM SYSTEMS, SCA

BELAR ELECTRONICS LABORATORY  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
MCMARTIN INDUSTRIES  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO  
VISUAL ELECTRONICS CORP

MONITORS, FM SYSTEMS, STEREO

AMECO, INC.  
BELAR ELECTRONICS LABORATORY  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
GOTHAM AUDIO CORPORATION  
KARG LABORATORIES  
MCMARTIN INDUSTRIES  
MELCOR ELECTRONICS  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO.  
VISUAL ELECTRONICS CORP

MONITORS, FREQUENCY

AMECO, INC.  
BELAR ELECTRONICS LABORATORY  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
G E VISUAL COMMUNICATIONS PROO  
HEWLETT-PACKARD CO.  
LAMPKIN LABORATORIES INC  
MCMARTIN INDUSTRIES

MICROLAB / FXR  
RCA BROADCAST PRODS.  
THE SINGER CO - METRICS DIV  
SINGER PRODUCTS CO  
TELETRONIX  
VISUAL ELECTRONICS CORP  
WILKINSON ELECTRONICS, INC

MONITORS, MODULATION

LAMPKIN LABORATORIES INC

MONITORS, PHASE

GATES RADIO COMPANY  
MICROLAB / FXR  
MULTRONICS  
RCA BROADCAST PRODS.  
VISUAL ELECTRONICS CORP  
VITRO ELECTRONICS

MONITORS, POWER

F W BELL, INC  
BIRD ELECTRONIC CORPORATION

MONITORS, VIDEO

AMECO, INC.  
AMPEX CORPORATION  
AMPLIVISION CORPORATION  
BLONDER-TONGUE LABORATORIES  
COMU ELECTRONICS  
CONRAC  
DIAMOND ELECTRONICS  
GBC AMERICA CORPORATION  
G E VISUAL COMMUNICATIONS PROO  
LAKE ELECTRONICS, INC.  
LAVIOLETTE ELECTRONICS  
MARCONI DIVISION  
MARYLAND TELECOMMUNICATIONS  
MIRATEL ELECTRONICS, INC  
RCA BROADCAST PRODS.  
SARKES-TARZIAN  
SETCHELL CARLSON INCORPORATED  
THE SINGER CO - METRICS DIV  
SONY CORPORATION OF AMERICA  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEMET COMPANY  
TELEQUIP CORPORATION  
TELEVISION UTILITIES CORP  
VISUAL ELECTRONICS CORP

MONITORS, WAVEFORM

COLORADO VIDEO  
HEWLETT-PACKARD CO.  
MARCONI DIVISION  
RCA BROADCAST PRODS.  
THE SINGER CO - METRICS DIV  
SONY CORPORATION OF AMERICA  
SYLVANIA-COMM. ELECTRONICS DIV  
TEKTRONIX INC  
VISUAL ELECTRONICS CORP

MOTORS, ELECTRIC - SEE HARDWARE

TOWNSEND ASSOCIATES

MOUNTS, ANTENNA, FIXED

AMECO, INC.  
ANDREW CORPORATION  
GATES RADIO COMPANY  
G C ELECTRONICS COMPANY  
JERROLD ELECTRONICS CORP  
LIBERTY TOWER MFG. CO  
PRODELIN, INCORPORATED  
RAYTHEON CO EQUIPMENT DIVISION  
RCA BROADCAST PRODS.  
ROHN MANUFACTURING CO.  
SCIENTIFIC-ATLANTA  
TECHNICAL APPLIANCE CORP  
TELEQUIP CORPORATION

MOUNTS, ANTENNA, MOBILE

GATES RADIO COMPANY  
G C ELECTRONICS COMPANY  
PRODELIN, INCORPORATED  
RAYTHEON CO EQUIPMENT DIVISION  
RCA BROADCAST PRODS.  
TECHNICAL APPLIANCE CORP  
TELEQUIP CORPORATION  
UTICA CORPORATION  
WATERS MANUFACTURING

MOUNTS, INSTRUMENT

ATLAS SOUND  
BIRNS & SAWYER  
TELEQUIP CORPORATION  
UTICA CORPORATION

MOUNTS, VIBRATION AND SHOCK

ELECTROVERT, INCORPORATED  
MINNESOTA MINING - 3 M

MULTIPLXERS

DAGE BELL CORPORATION  
RCA BROADCAST PRODS.  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEPHATION, INC.  
VIDEON CORPORATION

NAMEPLATES

D & B ELECTRONICS COMPANY  
MINNESOTA MINING - 3 M

NARROW BAND FM EQUIPMENT

AMECO, INC.  
AMPLIVISION CORPORATION  
COURIER COMMUNICATIONS  
MARTI ELECTRONICS  
MOSELEY ASSOCIATES INC.  
SINGER PRODUCTS CO  
STANDARD ELECTRONICS CORP  
TOWNSEND ASSOCIATES  
UTICA CORPORATION

NEEDLES, CUTTING - SEE STYLI

NEEDLES, PLAYBACK - SEE STYLI

NETWORKS, MATCHING, AUDIO

ALTEC LANSING

GATES RADIO COMPANY  
HARTLEY PRODUCTS  
LANGVIN  
SOUTHWESTERN COMMUNICATIONS  
STEPHENS ELECTRONICS

NETWORKS, MATCHING, RF

ALFORD MANUFACTURING COMPANY  
AMECO, INC.  
AMPLIVISION CORPORATION  
CCA ELECTRONICS CORPORATION  
NARDA MICROWAVE CORPORATION  
TELEVIC INDUSTRIES

NETWORKS, PHASING

AMERICAN ELECTRONIC LABS  
AMPLIVISION CORPORATION  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
JERROLD ELECTRONICS CORP  
MULTRONICS  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO.  
SOUTHWESTERN COMMUNICATIONS  
WARD ELECTRONIC INDUSTRIES

OHMMETERS

COMU ELECTRONICS  
ENGINEERING ASSOCIATES  
GOTHAM AUDIO CORPORATION  
HEATH CO  
HEWLETT-PACKARD CO.  
HICKOK ELECTRICAL INSTRUMENT  
INSTRUMENT LABORATORIES CORP  
RCA ELECTRONIC COMPONENTS  
TRIPLETT ELECTRICAL INSTRUMENT  
YOKOGAWA ELECTRIC WORKS

OSCILLATORS, AF AND RF

ALSO SEE GENERATORS

BENRUS  
CCA ELECTRONICS CORPORATION  
ENGINEERING ASSOCIATES  
GENERAL RADIO CO  
GIBBS MFG. AND RESEARCH CORP.  
HEATH CO  
HEWLETT-PACKARD CO.  
MARCONI INSTRUMENTS  
MICROLAB / FXR  
NARDA MICROWAVE CORPORATION  
RCA BROADCAST PRODS.  
ROHDE & SCHWARZ SALES CO. -USA  
SCIENTIFIC-ATLANTA  
SOUNDCRAFT INDUSTRIES  
TREPAC CORPORATION OF AMERICA  
WAVEFORMS, INCORPORATED

OSCILLATORS, AM

CCA ELECTRONICS CORPORATION  
ELECTRONIC RESEARCH COMPANY  
ENGINEERING ASSOCIATES  
GATES RADIO COMPANY  
GENERAL RADIO CO  
GIBBS MFG. AND RESEARCH CORP.  
HEATH CO  
HICKOK ELECTRICAL INSTRUMENT  
MARCONI INSTRUMENTS  
ROHDE & SCHWARZ SALES CO. -USA  
SOUTHWESTERN COMMUNICATIONS

OSCILLATORS, FM

BELAR ELECTRONICS LABORATORY  
CCA ELECTRONICS CORPORATION  
ELECTRONIC RESEARCH COMPANY  
GATES RADIO COMPANY  
GIBBS MFG. AND RESEARCH CORP.  
HEATH CO  
HICKOK ELECTRICAL INSTRUMENT  
MARCONI INSTRUMENTS  
ROHDE & SCHWARZ SALES CO. -USA  
SOUTHWESTERN COMMUNICATIONS  
STANDARD ELECTRONICS CORP.  
  
OSCILLATORS, TV  
GATES RADIO COMPANY  
GIBBS MFG. AND RESEARCH CORP.  
HEATH CO  
HICKOK ELECTRICAL INSTRUMENT  
RIVER VIDEO INDUSTRIES  
ROHDE & SCHWARZ SALES CO. -USA  
STANDARD ELECTRONICS CORP  
TELEMET COMPANY  
VIDEON CORPORATION

OSCILLATORS, OTHER

ETIMAC DIVISION OF VARIAN  
ELECTRONIC RESEARCH COMPANY  
ENGINEERING ASSOCIATES  
GIBBS MFG. AND RESEARCH CORP.  
MARCONI INSTRUMENTS  
NARDA MICROWAVE CORPORATION  
ROHDE & SCHWARZ SALES CO. -USA  
TELEVIC INDUSTRIES  
WAVEFORMS, INCORPORATED

OSCILLOSCOPES

ALLIED ELECTRONICS CORP  
BENRUS  
COLORADO VIDEO  
DATA INSTRUMENT DIVISION  
ENGINEERING ASSOCIATES  
HEATH CO  
HEWLETT-PACKARD CO.  
HICKOK ELECTRICAL INSTRUMENT  
ITI ELECTRONICS, INC.  
RCA BROADCAST PRODS.  
RCA ELECTRONIC COMPONENTS  
TEKTRONIX INC  
TELEQUIP CORPORATION

OVENS, CRYSTAL

ELECTRONIC RESEARCH COMPANY  
SINGER PRODUCTS CO.  
TRW ELECTRONICS

PANELS - SEE HARDWARE

PANELS, INSTRUMENT

FOR RACK MOUNTING -

ALSO SEE HARDWARE

BUD RADIO, INC  
COLORTAN INDUSTRIES - BERKEY  
GENERAL ELECTRIC CO  
SOUTHWESTERN COMMUNICATIONS  
TELEQUIP CORPORATION  
VENT-RAK INCORPORATED  
YOKOGAWA ELECTRIC WORKS

PAPER, CHART AND GRAPH

ENGINEERING ASSOCIATES  
MINNESOTA MINING - 3 M  
SCIENTIFIC-ATLANTA

PHASING UNITS - SEE

NETWORKS, PHASING

PHONOGRAPH TURNTABLES -

SEE TURNTABLES

PICKUP, MUSICAL INSTRUMENTS

CUSTOM CRAFT DESIGNS

PLOWS, CABLE LAYING

F. B. RYAN MFG. COMPANY, INC.

PLUGS, COAXIAL

ADC PRODUCTS  
AMECO, INC.  
AMERICAN PAMCOR, INC  
AMPHENOL DISTRIBUTOR DIVISION  
ENGINEERING ASSOCIATES  
ELECTRONICS ESSENTIALS OF CCC  
GENERAL RADIO CO  
JAMPRO ANTENNA COMPANY  
PHELPS DODGE  
RCA BROADCAST PRODS.  
ROBINS INDUSTRIES CORP.  
SINGER PRODUCTS CO.  
THE TECHNICAL MATERIEL CORP  
TROMPETER ELECTRONICS

PLUGS, PHONE

ADC PRODUCTS  
AMPHENOL DISTRIBUTOR DIVISION  
AUDIO ACCESSORIES  
BIRNBACH CO  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
HALLORY DISTRIBUTOR PRODUCTS  
RCA BROADCAST PRODS.  
ROBINS INDUSTRIES CORP.  
SINGER PRODUCTS CO.  
SWITCHCRAFT, INC.

POLE CLIMBING EQUIPMENT

AMECO, INC.  
PRUZAN COMPANY

POTENTIOMETERS, CARBON

AMERICAN ELITE  
AMPHENOL DISTRIBUTOR DIVISION  
CENTRALAB  
GOTHAM AUDIO CORPORATION  
IRC, INC.  
OHMITE MANUFACTURING COMPANY  
SINGER PRODUCTS CO.

POTENTIOMETERS, WIREWOUND

ALTEC LANSING  
AMPHENOL DISTRIBUTOR DIVISION  
CENTRALAB  
ENGINEERING ASSOCIATES  
GENERAL RADIO CO  
IRC, INC.  
OHMITE MANUFACTURING COMPANY  
PAINTON INCORPORATED  
SINGER PRODUCTS CO.  
WATERS MANUFACTURING

POWER SUPPLIES, AC

ADC PRODUCTS  
ALTEC LANSING  
AMECO, INC.  
ANACONDA ASTRODATA CO  
BIRNS & SAWYER  
BLONDER-TONGUE LABORATORIES  
COMU ELECTRONICS  
CORNELL-DOBILIER ELECTRONICS  
D & B ELECTRONICS COMPANY  
ENGINEERING ASSOCIATES  
FAIRCHILD RECORDING EQUIPMENT  
GATES RADIO COMPANY  
GENERAL ELECTRIC CO  
GENERAL RADIO CO  
GIBBS MFG. AND RESEARCH CORP.  
GREGORY AMPLIFIER CORP  
HEATH CO  
JERROLD ELECTRONICS CORP  
POWER SOURCES  
THE SINGER CO - METRICS DIV  
SOLA ELECTRIC  
SORENSEN OPERATION-RAYTHEON CO  
STACO, INC.  
STANDARD ELECTRONICS CORP  
TELEQUIP CORPORATION  
TREPAC CORPORATION OF AMERICA

POWER SUPPLIES, DC

ADC PRODUCTS  
ALMA ENGINEERING INC  
ALTEC LANSING  
AMECO, INC.  
BIRNS & SAWYER  
BLONDER-TONGUE LABORATORIES  
CENTURY PROJECTOR CORPORATION  
COMU ELECTRONICS  
CORNELL-DOBILIER ELECTRONICS  
DELTA ELECTRONICS, INC.  
ELECTRO PRODUCTS LABORATORIES  
ENGINEERING ASSOCIATES

# Tektronix Television Instruments

## Type 526 Vectorscope for Chroma-Signal Displays

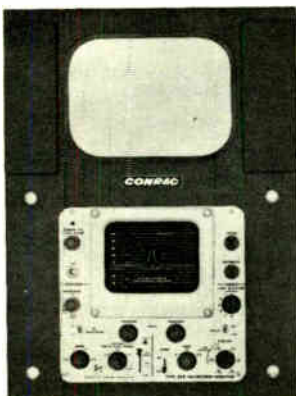
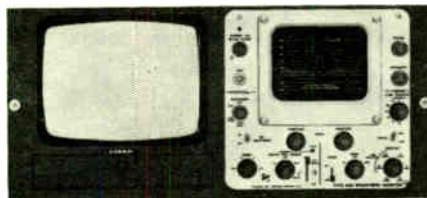
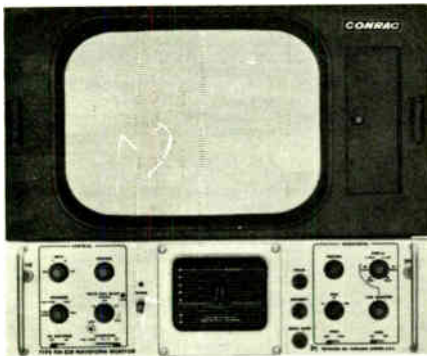
- color encoder adjustments
- differential phase measurements
- differential gain measurements
- vertical-interval-test-signal (VITS) displays
- video tape-recorder setup



Measuring amplitude changes and phase shifts can be done accurately, conveniently, and independently with the Vectorscope. The Vectorscope presents relative phase and amplitude displays (of chrominance information in the N.T.S.C. color signal). Dual-trace capability permits simultaneous display of two color signals for precise matching of phase and amplitude. In addition to the vector display, the Vectorscope can present the chroma signal demodulated along any phase-angle with respect to time.

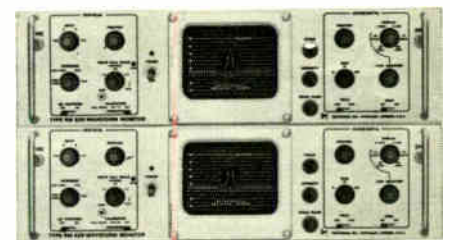
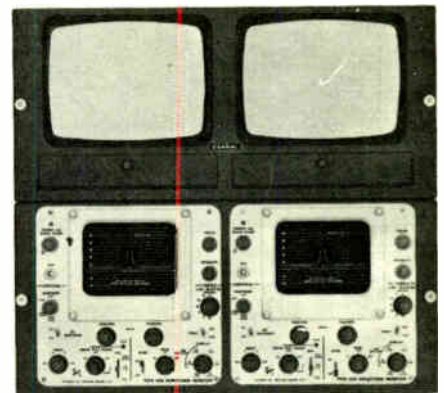
Type 526 Vectorscope . . . . . \$1665  
Size is 8 3/4" high, 19" wide, and 18" deep. Weight is ~ 45 pounds. Designed for rack mounting.

## Type 529/RM529 for Waveform Monitoring



- vertical-interval-test-signal (VITS) displays
- sine-squared pulse and bar testing
- transmitter modulation monitoring
- YRBG or RBG displays (with color-processing amplifiers)
- video signal-level monitoring
- bandwidth measurements
- differential-gain measurements

In waveform-monitoring applications, the Type 529 and RM529 offer 2 LINE and 2 FIELD displays plus calibrated sweep rates of 0.25 H/cm, 0.125 H/cm, 0.025 H/cm with X5 Magnifier, and 0.005 H/cm with X25 Magnifier. They provide 4 response characteristics necessary to monitor VITS—FLAT to 8 MHz (which assures excellent waveform fidelity for sine-squared testing with 2T, T, and 1/2T pulses), HIGH PASS 3.58 MHz, center frequency, LOW PASS—18 dB at 500 kHz, and IEEE 1958 STD 23-S-1. Other characteristics include a backporch type DC restorer, a positive-going field selector, and a full-field line-selector including digital VIT line selection.



Type 529 Waveform Monitor . . . . . \$1050  
(8 1/4" high, 8 1/2" wide, 19" deep, weighs 24 pounds.)

Rack Mount Type RM529 . . . . . \$1100  
(5 1/4" high, 19" wide, 20" deep, weighs 27 pounds.)

Power consumption of each model is ~ 80 watts — no fan used.

U.S. Sales Prices, f.o.b. Beaverton, Oregon

**Tektronix, Inc.**



For complete information, contact your nearby Tektronix field engineer or write: Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97005

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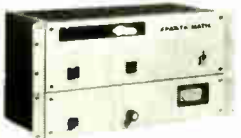
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# SPARTA-MATIC<sup>®</sup> TAPE CARTRIDGE SYSTEMS\*



**800C SERIES**  
Space saving, compact, table-top convenience • Transistorized modular electronics • Super-silent operation • Hinged lid for easy internal access



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Rack, table-top or cabinet mounting • Transistorized plug-in modules • 2nd and 3rd tone cue option • Separate record amplifier • Full remote operation

## NEW SPARTA ENGINEERED CH-5 TAPE CARTRIDGE TRANSPORT



Direct motor capstan drive eliminates belt driven assembly • Hysteresis synchronous motor with lifetime lubricated ball bearings • Exclusive super-silent solenoid system • Precision crafted for years of maintenance free service



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Provides quick and convenient tape cartridge auditioning • Excellent sales aid unit • Rechargeable battery and A/C operation • Extension speaker • Cartridge storage • Samsonite attache case with business paper portfolio

## MC-104

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Provides four independent plug-in CH-5 tape cartridge transports • Compact design for table-top (illustrated) or rack mount installation • Individual transistorized electronics • Manual or sequential operation • Multi tone and audio switcher options



### CD-15 TIME DELAY & REVERB UNIT

Time delay of 3 seconds to 31 minutes • Provides "before-air" censorship of conversational programing • Selective reverberation effects.



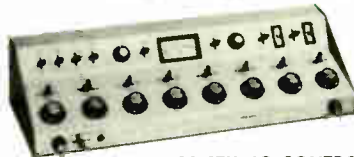
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ALL SPARTAMATIC  
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ALL SPARTA CONSOLES  
EXCEED FCC PROOF OF PERFORMANCE  
SPECIFICATIONS

# SPARTA AUDIO EQUIPMENT AND ACCESSORIES †



**AS-30  
STEREO AUDIO CONSOLE**  
Five stereo mixer channels • 14 stereo audio inputs • Monitor, cueing & muting terminal facilities provided • All transistorized modular electronics • Selectable stereo/mono mode control



**A-20 STUDIO CONTROL CONSOLE**  
Full facility audio control center • All transistorized • Eight mixers • Twenty-two inputs • Self-contained power supply • .5 watt monitor and .5 watt cue amplifier • Accommodates eight preamps (three supplied) • Individual electronic modules • Studio talkback provisions • Functional, space-saving compactness • All inputs and output are transformer balanced



**A-15 AUDIO CONSOLE**  
14 audio inputs • Five mixing channels • Built in monitor, cueing & muting systems • All transistorized modular electronics • Three line outputs plus P.A., head-phone & external speaker output • Accommodates up to four preamps



**RA-5 REMOTE MIXER**  
Two mixers • 3 audio inputs • Line test oscillator • P.A. output • 30 hour battery operation • Shoulder strap carrying case included



## AC-155 STUDIO/REMOTE UNIT

Recording studio • Remote broadcast • Main studio control • Full broadcast facility • Monitor & cue system • Muting • P. A. output • Solid state removable console • Two 3-speed custom turntable systems • Six low-level and eight high-level inputs •



## SHOWCASE CABINERY

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All sizes and standard lengths in stock • Cartridge reconditioning and reloading service.



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Faster and total erasing of cartridges and reels up to 10 1/2"



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## TC-12 CUSTOM TURNTABLE

Instant acceleration • Heavy-duty professional quality • Positive 3-speed lever control • Plays 45's without adapter • Trouble free performance

All prices subject to change

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ENGINEERING ASSOCIATES  
ESSEX WIRE CORPORATION  
ITT TELECOMMUNICATIONS  
RHM CONTROLS  
SIGMA INSTRUMENTS INC.

RELAYS, THERMAL  
BLONDFR-TONGUE LABORATORIES  
OIALIGHT CORPORATION  
ESSEX WIRE CORPORATION  
GENERAL ELECTRIC CO  
G-V CONTROLS INC.

RELAYS, TIME DELAY  
AMPERITE CO  
CORNELL-DUBILIER ELECTRONICS  
DIALIGHT CORPORATION  
ENGINEERING ASSOCIATES  
ESSEX WIRE CORPORATION  
GENERAL ELECTRIC CO  
HOUSTON ELECTRONICS CO.  
OHMITE MANUFACTURING COMPANY  
RHM CONTROLS  
STRUTHERS-DUNN  
TREPAC CORPORATION OF AMERICA  
G-V CONTROLS INC.  
MOLE-RICHARDSON CO.

REMOTE CONTROL SYSTEMS  
ALBION OPTICAL COMPANY  
BAUER ELECTRONICS CORPORATION  
ANDREW CORPORATION  
BIONIC INSTRUMENTS, INC.  
CENTRAL DYNAMICS CORPORATION  
CONTINENTAL ELECTRONICS MFG  
DELTA ELECTRONICS, INC.  
ENGINEERING ASSOCIATES  
F & M SYSTEMS COMPANY  
GATES RADIO COMPANY  
GENERAL ELECTRIC CO  
HANCOCK TELECONTROL  
MARTI ELECTRONICS  
MOSELEY ASSOCIATES INC.  
ORBIT RADIO  
SCHAFER ELECTRONICS  
SINGER PRODUCTS CO.  
SOUTHWESTERN COMMUNICATIONS  
TELETRONIX  
VISUAL ELECTRONICS CORP  
TREPAC CORPORATION OF AMERICA

RESISTORS, FIXED, CARBON  
AEROVOX CORP.  
AMERICAN ELITE  
AMPEREX ELECTRONIC CORP  
G C ELECTRONICS COMPANY  
IRC, INC.  
OHMITE MANUFACTURING COMPANY  
PAINTON INCORPORATED  
SINGER PRODUCTS CO.  
TEXAS INSTRUMENTS

RESISTORS, FIXED, NONINDUCTIVE  
GENERAL RADIO CO  
IRC, INC.  
OHMITE MANUFACTURING COMPANY  
VISHAY RESISTOR PRODUCTS DIV

RESISTORS, FIXED, PRECISION  
AEROVOX CORP.  
AMPHENOL DISTRIBUTOR DIVISION  
GENERAL RADIO CO  
IRC, INC.  
JORDAN ELECTRIC COMPANY  
MALLORY DISTRIBUTOR PRODUCTS  
OHMITE MANUFACTURING COMPANY  
PAINTON INCORPORATED  
TEXAS INSTRUMENTS  
VISHAY RESISTOR PRODUCTS DIV

RESISTORS, FIXED, WIREWOUND  
AMPHENOL DISTRIBUTOR DIVISION  
GENERAL ELECTRIC CO  
GENERAL RADIO CO  
HAMILTON HALL RESISTOR CORP.  
IRC, INC.  
JORDAN ELECTRIC COMPANY  
MALLORY DISTRIBUTOR PRODUCTS  
OHMITE MANUFACTURING COMPANY  
PAINTON INCORPORATED  
SINGER PRODUCTS CO.

RESISTORS, FIXED, OTHER  
AEROVOX CORP.  
AMPEREX ELECTRONIC CORP  
GENERAL ELECTRIC CO  
IRC, INC.  
OHMITE MANUFACTURING COMPANY  
PAINTON INCORPORATED

RESISTORS, VARIABLE, CARBON  
AMPHENOL DISTRIBUTOR DIVISION  
MALLORY DISTRIBUTOR PRODUCTS  
OHMITE MANUFACTURING COMPANY  
SINGER PRODUCTS CO.

RESISTORS, VARIABLE, WIREWOUND  
AMPHENOL DISTRIBUTOR DIVISION  
ENGINEERING ASSOCIATES  
G C ELECTRONICS COMPANY  
GENERAL RADIO CO  
IRC, INC.  
MALLORY DISTRIBUTOR PRODUCTS  
OHMITE MANUFACTURING COMPANY  
PAINTON INCORPORATED  
WATERS MANUFACTURING

REVERBERATION DEVICES -  
ALSO SEE AMPLIFIERS  
AMPLIFIER CORP OF AMERICA  
BAUER ELECTRONICS CORPORATION  
CLEVELAND ELECTRONICS  
SPEAKER DIVISION  
FAIRCHILD RECORDING EQUIPMENT  
GOTHAM AUDIO CORPORATION  
GREGORY AMPLIFIER CORP  
LITTLE JOE ENTERPRISES  
ORBIT RADIO  
SINGER PRODUCTS CO  
STEPHENS ELECTRONICS  
VISUAL ELECTRONICS CORP

REWINDERS, FILM  
BURKE & JAMES  
CENTURY PROJECTOR CORPORATION  
HARWALD COMPANY  
NEUMADE PRODUCTS CORPORATION  
RCA BROADCAST PRODS.

REWINDERS, TAPE  
HARVEY RADIO CO, INC.

RHEOSTATS  
ENGINEERING ASSOCIATES  
GENERAL ELECTRIC CO  
GENERAL RADIO CO  
MALLORY DISTRIBUTOR PRODUCTS  
NEUMADE PRODUCTS CORPORATION  
OHMITE MANUFACTURING COMPANY

RINGS, RETAINING - SEE HARDWARE

RODS, GROUND  
AMPLIVISION CORPORATION

SAFETY DEVICES, CLIMBING  
AIR SPACE DEVICES  
PRUZAN COMPANY

SCHOOLS, FACILITIES & EQUIPMENT  
SEE EDUCATION FACILITIES

SCRAMBLERS, SPEECH  
SINGER PRODUCTS CO  
TREPAC CORPORATION OF AMERICA

SCREENS, PROJECTION, FRONT  
ASCO SONOCRAFT CORP  
BIRNS & SAWYER  
BURKE & JAMES  
RAVEN SCREEN CORPORATION  
VISUAL ELECTRONICS CORP

SCREENS, PROJECTION, REAR  
BURKE & JAMES  
DISPLAY TECHNOLOGIES INC  
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VISUAL ELECTRONICS CORP  
H. WILSON CORPORATION

SEMICONDUCTOR DIODES  
AMERICAN ELECTRONIC LABS  
AMERICAN ELITE  
AMPEREX ELECTRONIC CORP  
G E DISTRIBUTOR SALES FORCE  
GENERAL ELECTRIC CO  
HEWLETT-PACKARD CO.  
INTERNATIONAL RECTIFIER  
IRC, INC.  
MICROLAB / FXR  
MICROWAVE ASSOCIATES, INC.  
MOTOROLA SEMICONDUCTOR  
OHMITE MANUFACTURING COMPANY  
RCA ELECTRONIC COMPONENTS  
SARKES-TARZIAN  
SINGER PRODUCTS CO.  
SOLITRON DEVICES  
SYLVANIA-SEMICONDUCTOR DIV.  
TEXAS INSTRUMENTS  
THOR ELECTRONICS  
TRW ELECTRONICS

SEMICONDUCTOR RECTIFIERS,  
GENERAL  
CENTURY PROJECTOR CORPORATION  
G E DISTRIBUTOR SALES FORCE  
GENERAL ELECTRIC CO  
INTERNATIONAL RECTIFIER  
IRC, INC.  
MALLORY DISTRIBUTOR PRODUCTS  
MOTOROLA SEMICONDUCTOR  
RCA ELECTRONIC COMPONENTS  
SARKES-TARZIAN  
SINGER PRODUCTS CO.  
SOLITRON DEVICES  
SYLVANIA-SEMICONDUCTOR DIV.  
TEXAS INSTRUMENTS  
THOR ELECTRONICS  
WILKINSON ELECTRONICS, INC

SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
G E DISTRIBUTOR SALES FORCE  
INTERNATIONAL RECTIFIER  
MOTOROLA SEMICONDUCTOR  
RCA ELECTRONIC COMPONENTS  
SARKES-TARZIAN  
SINGER PRODUCTS CO.  
SOLITRON DEVICES  
TEXAS INSTRUMENTS  
THOR ELECTRONICS  
TRW ELECTRONICS  
WILKINSON ELECTRONICS, INC

SEMICONDUCTOR RECTIFIERS,  
POWER  
G E DISTRIBUTOR SALES FORCE  
GENERAL ELECTRIC CO  
INTERNATIONAL RECTIFIER  
MALLORY DISTRIBUTOR PRODUCTS  
MOTOROLA SEMICONDUCTOR

RCA ELECTRONIC COMPONENTS  
SARKES-TARZIAN  
SINGER PRODUCTS CO.  
SOLITRON DEVICES  
SYLVANIA-SEMICONDUCTOR DIV.  
TEXAS INSTRUMENTS  
THOR ELECTRONICS  
WILKINSON ELECTRONICS, INC

SEMICONDUCTOR RECTIFIERS,  
SILICON CONTROLLED - SCR  
AMPEREX ELECTRONIC CORP  
DELCO RADIO DIV  
G E DISTRIBUTOR SALES FORCE  
GENERAL ELECTRIC CO  
INTERNATIONAL RECTIFIER  
IRC, INC.  
MOTOROLA SEMICONDUCTOR  
RCA ELECTRONIC COMPONENTS  
SARKES-TARZIAN  
TEXAS INSTRUMENTS  
THOR ELECTRONICS

SEMICONDUCTORS, THYRISTORS  
AMPEREX ELECTRONIC CORP  
G E DISTRIBUTOR SALES FORCE  
INTERNATIONAL RECTIFIER  
IRC, INC.  
MOTOROLA SEMICONDUCTOR  
RCA ELECTRONIC COMPONENTS  
TEXAS INSTRUMENTS  
THOR ELECTRONICS

SEMICONDUCTORS, TRANSISTORS, AF  
AMERICAN ELITE  
AMPEREX ELECTRONIC CORP  
DELCO RADIO DIV  
G E DISTRIBUTOR SALES FORCE  
INTERNATIONAL RECTIFIER  
LAKE ELECTRONICS, INC.  
MOTOROLA SEMICONDUCTOR  
RCA ELECTRONIC COMPONENTS  
SINGER PRODUCTS CO.  
SOLITRON DEVICES  
SYLVANIA-SEMICONDUCTOR DIV.  
TEXAS INSTRUMENTS  
THOR ELECTRONICS

SEMICONDUCTORS, TRANSISTORS, FE  
AMPEREX ELECTRONIC CORP  
G E DISTRIBUTOR SALES FORCE  
MOTOROLA SEMICONDUCTOR  
RCA ELECTRONIC COMPONENTS  
TEXAS INSTRUMENTS  
THOR ELECTRONICS

SEMICONDUCTORS, TRANSISTORS,  
GENERAL  
AMPEREX ELECTRONIC CORP  
DELCO RADIO DIV  
G E DISTRIBUTOR SALES FORCE  
GENERAL ELECTRIC CO  
INTERNATIONAL RECTIFIER  
LAKE ELECTRONICS, INC.  
MOTOROLA SEMICONDUCTOR  
RCA ELECTRONIC COMPONENTS  
SINGER PRODUCTS CO.  
SOLITRON DEVICES  
SYLVANIA-SEMICONDUCTOR DIV.  
TEXAS INSTRUMENTS  
THOR ELECTRONICS  
TRW ELECTRONICS

SEMICONDUCTORS, TRANSISTORS, RF  
AMERICAN ELITE  
AMPEREX ELECTRONIC CORP  
G E DISTRIBUTOR SALES FORCE  
INTERNATIONAL RECTIFIER  
MOTOROLA SEMICONDUCTOR  
RCA ELECTRONIC COMPONENTS  
SOLITRON DEVICES  
SYLVANIA-SEMICONDUCTOR DIV.  
TEXAS INSTRUMENTS  
THOR ELECTRONICS  
TRW ELECTRONICS

SERVICES, FREQUENCY-MEASUREMENT  
SEE CALIBRATION SERVICES,  
FREQUENCY

SERVICES, INSTALLATION  
GRINMAN FICTURE COMPANY  
GULF ELECTRO-SALES INC

SERVICES, MAINTENANCE -  
SEE MAINTENANCE SERVICES

SHIELDINGS, TUBE  
ELECTRONICS ESSENTIALS OF CCC

SHIFTERS, PHASE, MICROWAVE  
DEMORNY - BONARDI DIVISION  
MICROWAVE ASSOCIATES, INC.  
NARDA MICROWAVE CORPORATION  
PRODELIN, INCORPORATED

SHUNTS, METER  
ENGINEERING ASSOCIATES  
G E INDUSTRIAL SALES OPERATION  
GENERAL ELECTRIC CO  
THE SINGER CO - METRICS DIV  
TRIPLETT ELECTRICAL INSTRUMENT

SLIDES, CHASSIS  
BUD RADIO, INC  
CHASSIS TRAK  
ELECTRONICS ESSENTIALS OF CCC  
ROBINS INDUSTRIES CORP.  
VENT-RAK INCORPORATED

SLOTTED SECTIONS  
ALFORD MANUFACTURING COMPANY  
DEMORNY - BONARDI DIVISION  
MICROLAB / FXR  
MICRO-LINK SYSTEMS/VARIAN ASSO



NARDA MICROWAVE CORPORATION  
PHELPS DODGE  
PRODELIN, INCORPORATED  
ROMBE & SCHWARZ SALFS. CO. -USA

SOCKETS, CRYSTAL

E F JOHNSON COMPANY

SOCKETS, LAMP

AUDIO ACCESSORIES  
DIALIGHT CORPORATION  
ELECTRONICS ESSENTIALS OF CCC  
E F JOHNSON COMPANY

SOCKETS, TUBE

AERVOX CORP.  
EIMAC DIVISION OF VARIAN  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
E F JOHNSON COMPANY

SOLDER

G C ELECTRONICS COMPANY  
SINGER PRODUCTS CO.

SOLVENTS AND CLEANERS

G C ELECTRONICS COMPANY  
HARWALD COMPANY  
NEUMADE PRODUCTS CORPORATION  
RDRINS INDUSTRIES CORP.

SOUND SYSTEMS, OUTDOOR

ALTEC LANSING  
AMERICAN GELOSO ELECTRONICS  
AMPEX CORPORATION  
APPLIED ELECTRO-MECHANICS  
ATLAS SOUND  
AUDIO INSTRUMENT CO  
GREGORY AMPLIFIER CORP  
HARVEY RADIO CO. INC.  
HOUSTON ELECTRONICS CO.  
JENSEN MANUFACTURING  
JAMES B LANSING SOUND CO  
MCMARTIN INDUSTRIES  
NORTH AMERICAN PHILIPS CO  
RCA BROADCAST PRODS.  
SOUTHWESTERN COMMUNICATIONS  
TRUSONIC

SOUND SYSTEMS, PORTABLE

ALTEC LANSING  
AMERICAN GELOSO ELECTRONICS  
AMPEX CORPORATION  
APPLIED ELECTRO-MECHANICS  
CALIFONE/ROBERTS  
CENTURY PROJECTOR CORPORATION  
GREGORY AMPLIFIER CORP  
HARVEY RADIO CO. INC.  
HOUSTON ELECTRONICS CO.  
JENSEN MANUFACTURING  
MCMARTIN INDUSTRIES  
NORTH AMERICAN PHILIPS CO  
ORBIT RADIO  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO.  
SONY CORPORATION OF AMERICA  
SOUTHWESTERN COMMUNICATIONS  
TRUSONIC

SOUND SYSTEMS, THEATER

ALTEC LANSING  
AMPEX CORPORATION  
ATLAS SOUND  
AUDIO INSTRUMENT CO  
CENTURY PROJECTOR CORPORATION  
GREGORY AMPLIFIER CORP  
HARVEY RADIO CO. INC.  
HOUSTON ELECTRONICS CO.  
JENSEN MANUFACTURING  
JAMES B LANSING SOUND CO  
MCMARTIN INDUSTRIES  
MID AMERICA ELECTRONICS CORP  
NORTH AMERICAN PHILIPS CO  
RCA BROADCAST PRODS.  
TRUSONIC

SPEAKER COMPONENTS

ALTEC LANSING  
AMERICAN GELOSO ELECTRONICS  
ATLAS SOUND  
CALBEST ELECTRONICS  
ELECTRO-VOICE INC  
ELECTRONICS ESSENTIALS OF CCC  
JENSEN MANUFACTURING  
JAMES B LANSING SOUND CO  
NORTH AMERICAN PHILIPS CO  
PERMOFLUX CORPORATION  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO  
SONY CORPORATION OF AMERICA  
TRUSONIC

SPEAKERS

ALTEC LANSING  
AMERICAN ELITE  
AMERICAN GELOSO ELECTRONICS  
AMPEX CORPORATION  
ATLAS SOUND  
CALIFONE/ROBERTS  
CCA ELECTRONICS CORPORATION  
CENTURY PROJECTOR CORPORATION  
CLEVELAND ELECTRONICS  
SPEAKER DIVISION  
ELECTRO-SOUND ACOUSTICS  
ELECTRO-VOICE INC  
GATES RADIO COMPANY  
GREGORY AMPLIFIER CORP  
HARTLEY PRODUCTS  
JENSEN MANUFACTURING  
KOSS ELECTRONICS, INC.  
LAKE ELECTRONICS, INC.  
JAMES B LANSING SOUND CO  
MCMARTIN INDUSTRIES  
NORTH AMERICAN PHILIPS CO  
OAKTRON INDUSTRIES, INC.  
PERMOFLUX CORPORATION  
RCA BROADCAST PRODS.

SEYCHELL CARLSON INCORPORATED  
SINGER PRODUCTS CO  
SONY CORPORATION OF AMERICA  
TRUSONIC  
TRW ELECTRONICS

SPLICERS, MAGNETIC TAPE & FILM

BIRNS & SAWYER  
BROADCAST ELECTRONICS, INC  
BURKE & JAMES  
G C ELECTRONICS COMPANY  
HARWALD COMPANY  
THE KALART COMPANY  
MINNESOTA MINING - 3 M  
MINUMADE PRODUCTS CORPORATION  
PRECISION LABORATORIES  
RCA BROADCAST PRODS.  
ROBINS INDUSTRIES CORP.  
SPARTA ELECTRONIC CORPORATION

STANDS, TELEVISION MONITOR

GENERAL TELEVISION NETWORK

STL EQUIPMENT

ANDREW CORPORATION  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
JERROLD ELECTRONICS CORP  
MARTI ELECTRONICS  
MCMARTIN INDUSTRIES  
MICRO-LINK SYSTEMS/VARIAN ASSO  
MOSLEY ASSOCIATES INC.  
RCA BROADCAST PRODS.  
RMG ELECTRONICS LABORATORY  
SARKES-TARZIAN  
SINGER PRODUCTS CO  
TELEMET COMPANY  
TELETRONIX  
TREPAC CORPORATION OF AMERICA  
VISUAL ELECTRONICS CORP

STROBE, DISC

G C ELECTRONICS COMPANY  
GENERAL RADIO CO  
LANG ELECTRONICS, INC  
ROBINS INDUSTRIES CORP.

STROBE, LIGHT

BERKEY TECHNICAL CORP  
ELECTRONIC LIGHTS, INC.  
G C ELECTRONICS COMPANY  
GENERAL RADIO CO  
ROBINS INDUSTRIES CORP.

STYLI, CUTTING

THE ASTATIC CORPORATION  
DUOTONE COMPANY INC  
SINGER PRODUCTS CO.  
TRANSCO PRODUCTS, INTL

STYLI, PLAYBACK

THE ASTATIC CORPORATION  
DUOTONE COMPANY INC  
SHURE BROTHERS, INC.  
TRANSCO PRODUCTS, INTL

SWITCHERS

ALMA ENGINEERING INC  
AMECO, INC.  
AMERICAN PAMCOR, INC  
BLONDER-TONGUE LABORATORIES  
CENTRAL DYNAMICS CORPORATION  
COMU ELECTRONICS  
DYNAIR ELECTRONICS, INC.  
G E VISUAL COMMUNICATIONS PROD  
INTERNATIONAL GOOD MUSIC  
INTERNATIONAL NUCLEAR CORP.  
JENNINGS RADIO MANUFACTURING  
RCA BROADCAST PRODS.  
RIKER VIDEO INDUSTRIES  
SCHAFFER ELECTRONICS  
SOUTHWESTERN COMMUNICATIONS  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEMATION, INC.  
TREPAC CORPORATION OF AMERICA  
VISION CORPORATION  
VISUAL ELECTRONICS CORP  
WARD ELECTRONIC INDUSTRIES

SWITCHES, COAXIAL

ALFORD MANUFACTURING COMPANY  
AMERICAN ELECTRONIC LABS  
ANDREW CORPORATION  
BARKER & WILLIAMSON  
BIRD ELECTRONIC CORPORATION  
BLONDER-TONGUE LABORATORIES  
ENGINEERING ASSOCIATES  
JAMPRO ANTENNA COMPANY  
JENNINGS RADIO MANUFACTURING  
JERROLD ELECTRONICS CORP  
MICROLAB / FR  
MICROWAVE ASSOCIATES, INC.  
NARDA MICROWAVE CORPORATION  
PRODELIN, INCORPORATED  
SINGER PRODUCTS CO.  
THE TECHNICAL MATERIEL CORP  
TROMPETER ELECTRONICS  
WATERS MANUFACTURING

SWITCHES, CROSSBAR

CENTRAL DYNAMICS CORPORATION  
INTERNATIONAL NUCLEAR CORP.  
ITT TELECOMMUNICATIONS  
JENNINGS RADIO MANUFACTURING  
TROMPETER ELECTRONICS

SWITCHES, FOOT

ATLAS SOUND  
GENERAL ELECTRIC CO

SWITCHES, ILLUMINATED

DIALIGHT CORPORATION  
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E F JOHNSON COMPANY  
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DONALD P. MOSSMAN, INC.  
DAK MANUFACTURING CO  
SWITCHCRAFT, INC.

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GENERAL ELECTRIC CO  
JENNINGS RADIO MANUFACTURING  
DAK MANUFACTURING CO  
DHMITE MANUFACTURING COMPANY  
WABER ELECTRONICS, INC.

**SWITCHES, MULTICONTACT**  
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CENTRALAB  
HICKOK ELECTRICAL INSTRUMENT  
LANGEVIN  
DONALD P. MOSSMAN, INC.  
DAK MANUFACTURING CO  
PAINTON INCORPORATED  
SWITCHCRAFT, INC.

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AMERICAN ELITE  
BIRNBACH CO  
CENTRALAB  
G C ELECTRONICS COMPANY  
GENFRAL ELECTRIC CO  
MALLORY DISTRIBUTOR PRODUCTS  
DONALD P. MOSSMAN, INC.  
OAK MANUFACTURING CO  
PAINTON INCORPORATED  
SWITCHCRAFT, INC.

**SWITCHES, ROTARY**  
ALTEC LANSING  
AMERICAN ELITE  
CENTRALAB  
ENGINEERING ASSOCIATES  
G C ELECTRONICS COMPANY  
GENERAL ELECTRIC CO  
INDUSTRIAL DEVICES, INC.  
JENNINGS RADIO MANUFACTURING  
JERROLD ELECTRONICS CORP  
LANGEVIN  
MALLORY DISTRIBUTOR PRODUCTS  
DAK MANUFACTURING CO  
DHMITE MANUFACTURING COMPANY  
PAINTON INCORPORATED  
SINGER PRODUCTS CO.

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AMERICAN ELITE  
BIRNBACH CO  
CENTRALAB  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
DAK MANUFACTURING CO  
SINGER PRODUCTS CO.  
SWITCHCRAFT, INC.

**SWITCHES, SNAP**  
ELECTRONIC RESEARCH COMPANY  
ELECTRONICS ESSENTIALS OF CCC  
GENERAL ELECTRIC CO  
E F JOHNSON COMPANY  
DAK MANUFACTURING CO  
ROBINS INDUSTRIES CORP.  
SINGER PRODUCTS CO.

**SWITCHES, TELEPHONE TYPE**  
ITT TELECOMMUNICATIONS  
DONALD P. MOSSMAN, INC.  
SWITCHCRAFT, INC.

**SWITCHES, THERMAL**  
ELECTRONIC RESEARCH COMPANY  
GENERAL ELECTRIC CO  
G-V CONTROLS INC.

**SWITCHES, TOGGLE**  
AMERICAN ELITE  
BIRNBACH CO  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
GENERAL ELECTRIC CO  
PAINTON INCORPORATED  
ROBINS INDUSTRIES CORP.  
SINGER PRODUCTS CO.

**SWITCHES, WAVEGUIDE**  
AMERICAN ELECTRONIC LABS  
ANDREW CORPORATION  
DEMORNAV - BONARDI DIVISION  
MICROLAB / FXR  
MICROWAVE ASSOCIATES, INC.

**SWITCHING MATRICES**  
ALMA ENGINEERING INC  
AMERICAN PAMCOR, INC  
ANDREW CORPORATION  
CENTRAL DYNAMICS CORPORATION  
COHU ELECTRONICS  
DELTA ELECTRONICS INC  
INTERNATIONAL NUCLEAR CORP.  
JENNINGS RADIO MANUFACTURING

MULTRONICS  
SARKES-TARZIAN  
SCHAFFER ELECTRONICS  
S. STERLING COMPANY  
SWITCHCRAFT, INC.  
TELEMET COMPANY  
TREPETER ELECTRONICS  
WARD ELECTRONIC INDUSTRIES

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ALMA ENGINEERING INC  
AMERICAN PAMCOR, INC  
ANDREW CORPORATION  
CENTRAL DYNAMICS CORPORATION  
COHU ELECTRONICS  
DYNAIR ELECTRONICS, INC.  
F & M SYSTEMS COMPANY  
GATES RADIO COMPANY  
HANDCOCK TELECONTROL  
INTERNATIONAL GOOD MUSIC  
INTERNATIONAL NUCLEAR CORP.  
ITT TELECOMMUNICATIONS  
JENNINGS RADIO MANUFACTURING  
RCA BROADCAST PRODS.  
RIKER VIDEO INDUSTRIES  
SARKES-TARZIAN  
STEPHENS ELECTRONICS  
S. STERLING COMPANY  
SWITCHCRAFT, INC.  
TELEQUIP CORPORATION  
TREPAC CORPORATION OF AMERICA  
TROMPETER ELECTRONICS  
VIDEON CORPORATION  
VISUAL ELECTRONICS CORP  
VITAL INDUSTRIES  
WARD ELECTRONIC INDUSTRIES

**TAPE DECKS, MAGNETIC**  
AMPFX CORPORATION  
AMPLIVISION CORPORATION  
ASCO SONOCRAFT CORP  
AUDIO INSTRUMENT CO  
BROADCAST ELECTRONICS, INC  
CONTINENTAL ELECTRONICS MFG  
CROWN INTERNATIONAL  
DISPLAY TECHNOLOGIES INC  
GATES RADIO COMPANY  
IMPEX ELECTRONICS CORP  
INTERNATIONAL GOOD MUSIC  
JETRONIC INDUSTRIES, INC.  
KRS INSTRUMENTS DIVISION  
MACKENZIE LABORATORIES  
MAGNA-TECH CORPORATION  
MAGNECORD  
MINNESOTA MINING - 3 M  
RCA BROADCAST PRODS.  
SCHAFFER ELECTRONICS  
SINGER PRODUCTS CO  
STAC, INC.  
STANCLIFF-HOFFMAN CORPORATION  
TELECTRO INDUSTRIES CORP  
VIKING OF MINNEAPOLIS  
VISUAL ELECTRONICS CORP

**TAPE DUPLICATORS**  
AMPX CORPORATION  
ASCO SONOCRAFT CORP  
BIONIC INSTRUMENTS, INC.  
CROWN INTERNATIONAL  
HARVEY RADIO CO, INC.  
LANG ELECTRONICS, INC  
MAGNA-TECH CORPORATION  
MAGNECORD  
MINNESOTA MINING - 3 M  
SINGER PRODUCTS CO  
TELECTRO INDUSTRIES CORP  
VIKING OF MINNEAPOLIS  
VISUAL ELECTRONICS CORP

**TAPE, MAGNETIC RECORDING, AUDIO**  
ALLIED ELECTRONICS CORP  
AMERICAN GELOSD ELECTRONICS  
AMPX CORPORATION  
ASCO SONOCRAFT CORP  
THE ASTATIC CORPORATION  
AUDIO DEVICES  
BIRNS & SAWYER  
BROADCAST ELECTRONICS, INC  
BURGESS BATTERY COMPANY  
COMPUTRON INC  
DUOTONE COMPANY INC  
EASTMAN KODAK COMPANY  
IMPEX ELECTRONICS CORP  
JDA CARTRIDGE SERVICE  
MACARTA INC.  
MAGNETIC MEDIA CORPORATION  
MINNESOTA MINING - 3 M  
RCA BROADCAST PRODS.  
REEVES SOUNDRAFT  
ROBINS INDUSTRIES CORP.  
SARKES-TARZIAN  
SINGER PRODUCTS CO  
TAPECASTER ELECTRONICS  
WIDE RESPONSE

**TAPE, MAGNETIC RECORDING, AUDIO, CARTRIDGE**  
AUDIO DEVICES  
BROADCAST ELECTRONICS, INC  
MINNESOTA MINING - 3 M  
SPARTA ELECTRONIC CORPORATION

**TAPE, MAGNETIC RECORDING, COMPUTER**  
AMPX CORPORATION  
AUDIO DEVICES  
COMPUTRON INC  
MAGNETIC MEDIA CORPORATION  
MEMOREX CORPORATION  
MINNESOTA MINING - 3 M  
REEVES SOUNDRAFT

**TAPE, MAGNETIC RECORDING, TEST**  
AMPX CORPORATION  
AUDIO DEVICES  
COMPUTRON INC

GATES RADIO COMPANY  
MINNEAPOLIS MAGNETICS  
MINNESOTA MINING - 3 M  
NDRTRONICS COMPANY, INC  
ORBIT RADIO

**TAPE, MAGNETIC RECORDING, VIDEO**  
AMECO, INC.  
AMPX CORPORATION  
AMPLIVISION CORPORATION  
ASCO SONOCRAFT CORP  
COMPUTRON INC  
MAGNETIC MEDIA CORPORATION  
MEMOREX CORPORATION  
MINNESOTA MINING - 3 M  
RCA BROADCAST PRODS.  
REEVES SOUNDRAFT  
SONY CORPORATION OF AMERICA  
TELEVISION UTILITIES CORP

**TAPE, MAGNETIC, GRAPHIC**  
KRS INSTRUMENTS DIVISION  
MINNESOTA MINING - 3 M

**TELEPHONE EQUIPMENT**  
ALTEC LANSING  
AMERICAN ELITE  
AUDIO INSTRUMENT CO  
BROADCAST ELECTRONICS, INC  
COOK ELECTRIC COMPANY  
ELECTRONICS ESSENTIALS OF CCC  
THE JAMES FLOYD FORD CO  
HEWLETT-PACKARD CO.  
ITT TELECOMMUNICATIONS  
RDANWELL CORPORATION  
TELEMET COMPANY

**TERMINAL BLOCKS**  
ADC PRODUCTS  
AMERICAN PAMCOR, INC  
BUCHANAN ELECTRICAL PRODS CORP  
COOK ELECTRIC COMPANY  
ELECTRONICS ESSENTIALS OF CCC  
GENERAL ELECTRIC CO  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO.  
THE THOMAS & BETTS CO

**TERMINAL BOARDS**  
ADC PRODUCTS  
BUCHANAN ELECTRICAL PRODS CORP  
D & B ELECTRONICS COMPANY  
ELECTRONICS ESSENTIALS OF CCC  
GENERAL ELECTRIC CO  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO.  
THE THOMAS & BETTS CO  
UTILITY PRODUCTS CO.

**TERMINAL CARDS**  
ACME VISIBLE RECORDS  
BUCHANAN ELECTRICAL PRODS CORP  
D & B ELECTRONICS COMPANY

**TERMINAL STRIPS**  
ADC PRODUCTS  
BIRNBACH CO  
BUCHANAN ELECTRICAL PRODS CORP  
D & B ELECTRONICS COMPANY  
ELECTRONICS ESSENTIALS OF CCC  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO.  
VITRO ELECTRONICS

**TERMINALS, BARRIER**  
BUCHANAN ELECTRICAL PRODS CORP  
ELECTRONICS ESSENTIALS OF CCC  
RCA BROADCAST PRODS.  
THE THOMAS & BETTS CO

**TERMINALS, HIGH VOLTAGE**  
AMERICAN PAMCOR, INC  
ELECTRONICS ESSENTIALS OF CCC  
PHELPS DODGE

**TERMINALS, LUG**  
AMERICAN PAMCOR, INC  
BIRNBACH CO  
BUCHANAN ELECTRICAL PRODS CORP  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
HOLLINGSWORTH SOLDERLESS  
TERMINAL CO  
SINGER PRODUCTS CO.  
THE THOMAS & BETTS CO

**TERMINALS, SOLDER**  
BIRNBACH CO  
BUCHANAN ELECTRICAL PRODS CORP  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
SINGER PRODUCTS CO.

**TERMINALS, SOLDERLESS**  
AEROVIX CORP.  
AMERICAN PAMCOR, INC  
BIRNBACH CO  
BUCHANAN ELECTRICAL PRODS CORP  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
HOLLINGSWORTH SOLDERLESS  
TERMINAL CO  
SINGER PRODUCTS CO.  
THE THOMAS & BETTS CO

**TESTERS, BATTERY**  
GENERAL ELECTRIC CO  
GOTHAM AUDIO CORPORATION  
HICKOK ELECTRICAL INSTRUMENT  
MALLORY DISTRIBUTOR PRODUCTS  
SINGER PRODUCTS CO.

**TESTERS, CAPACITOR**  
CORNELL-DUBILIER ELECTRONICS  
GENERAL RADIO CO  
HICKOK ELECTRICAL INSTRUMENT  
RHODE & SCHWARZ SALES CO. -USA

**TESTERS, INSULATION**  
ENGINEERING ASSOCIATES  
GENERAL ELECTRIC CO  
GENERAL RADIO CO  
GOTHAM AUDIO CORPORATION  
RHODE & SCHWARZ SALES CO. -USA  
SINGER PRODUCTS CO  
TELEMET COMPANY  
YOKOGAWA ELECTRIC WORKS

**TESTERS, SEMICONDUCTOR**  
AMERICAN ELECTRONIC LABS  
DELTA ELECTRONICS, INC.  
HICKOK ELECTRICAL INSTRUMENT  
RHODE & SCHWARZ SALES CO. -USA  
SOLITRON DEVICES  
TEKTRONIX INC  
TRIPLETT ELECTRICAL INSTRUMENT

**TESTERS, VACUUM TUBE**  
ALLIED ELECTRONICS CORP  
ENGINEERING ASSOCIATES  
HICKOK ELECTRICAL INSTRUMENT  
RCA ELECTRONIC COMPONENTS  
TEKTRONIX INC  
TRIPLETT ELECTRICAL INSTRUMENT

**THYRISTORS - SEE SEMICONDUCTORS**

**TIMERS, ELECTRIC**  
BIONIC INSTRUMENTS, INC.  
BURKE & JAMES  
CURTIS INSTRUMENTS  
ENGINEERING ASSOCIATES  
GENERAL ELECTRIC CO  
GIBBS MFG. AND RESEARCH CORP.  
G-V CONTROLS INC.  
HICKOK ELECTRICAL INSTRUMENT  
MALLORY DISTRIBUTOR PRODUCTS  
SELA ELECTRONICS CO.

**TIMERS, MANUAL**  
THE ELMOR COMPANY  
JULES RACINE CO INC

**TOOLS, CLAMPS**  
AMECO, INC.

**TOOLS, CRIMPERS**  
AEROVIX CORP.  
AMECO, INC.  
AMERICAN PAMCOR, INC  
BLONDRF-TONGUE LABORATORIES  
BUCHANAN ELECTRICAL PRODS CORP  
HOLLINGSWORTH SOLDERLESS  
TERMINAL CO  
MATHIAS KLEIN & SONS  
MINNESOTA MINING - 3 M  
H. K. PORTER INC.  
THE THOMAS & BETTS CO

**TOOLS, CUTTERS**  
MATHIAS KLEIN & SONS  
H. K. PORTER INC.  
THE THOMAS & BETTS CO  
XCELITE INCORPORATED

**TOOLS, HAND**  
ELECTRONICS ESSENTIALS OF CCC  
HOLLINGSWORTH SOLDERLESS  
TERMINAL CO  
MATHIAS KLEIN & SONS  
H. K. PORTER INC.  
SINGER PRODUCTS CO.  
THE THOMAS & BETTS CO  
UPSON BROS.  
XCELITE INCORPORATED

**TOOLS, PLIERS**  
MATHIAS KLEIN & SONS  
SINGER PRODUCTS CO.  
XCELITE INCORPORATED

**TOOLS, PUNCH, CHASSIS**  
GREENLEE TOOL COMPANY

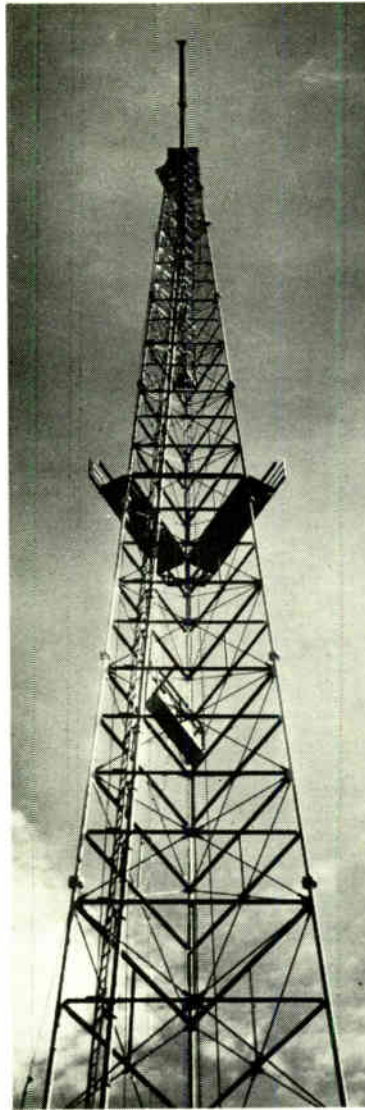
**TOOLS, SCREWDRIVERS**  
ELECTRONICS ESSENTIALS OF CCC  
G C ELECTRONICS COMPANY  
MATHIAS KLEIN & SONS  
SINGER PRODUCTS CO.  
UPSON BROS.  
XCELITE INCORPORATED

**TOOLS, SOLDERING IRONS, GUN**  
SINGER PRODUCTS CO.

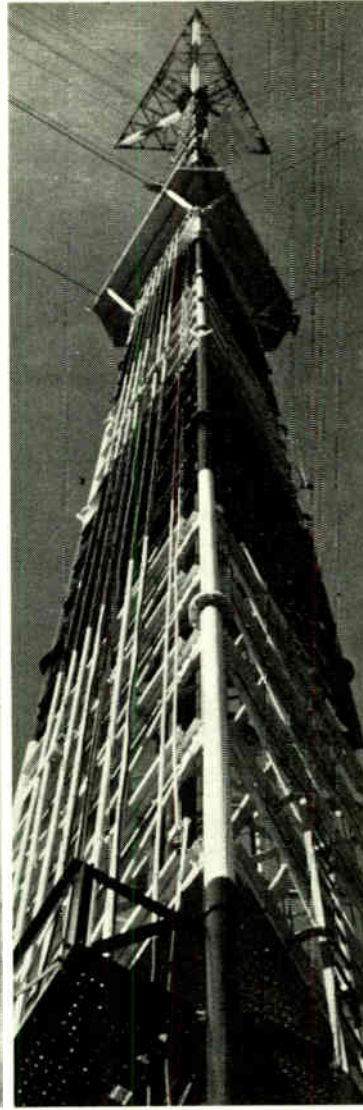
**TOOLS, SOLDERING IRONS, INDUSTRIAL**  
SINGER PRODUCTS CO.  
UNGAR ELECTRIC TOOLS

**TOOLS, WRENCHES**  
ELECTRONICS ESSENTIALS OF CCC  
MATHIAS KLEIN & SONS  
XCELITE INCORPORATED

**TOWERS, ANTENNA, CATV, HEAD-END**  
ADVANCE INDUSTRIES  
AMECO, INC.  
AMPLIVISION CORPORATION  
ANTENNA PRODUCTS COMPANY  
BLAW-KNOX COMPANY  
DRESSER CRANE HOIST & TOWER  
FORT WORTH TOWER CO., INC.  
HY-GAIN ELECTRONICS  
JERROLD ELECTRONICS CORP  
KLINE IRON & STEEL COMPANY  
LIBERTY TOWER MFG. CO



*At Rochester, N. Y., this self-supporting tower gives the WOKR antenna 306.5' elevation above the ground.*



*Candelabra® tower carries 3 antenna as high as 1549' above ground for KCRA-TV, KOVR, KXTV.*

## TOWERS BY DRESSER FOR TV, RADIO, MICROWAVE, RADAR

**TV AND RADIO BROADCAST ANTENNA TOWERS**—*Types:* guyed or self-supporting. Can be insulated. Guyed available with fixed or pivoted base. *Heights:* available in any height. *Wind Loads:* 20 lb. through 90 lb. available as standard. Heavier loads available when required. *Antenna Loads:* designs available for any single TV or radio antenna, or any combination of antennas in stacked, side-mounted, or Candelabra (R) arrangements.

**MICROWAVE TOWERS**—*Types:* guyed or self-supporting. *Heights:* 50' through 300' available as standard. Greater heights available when required. *Wind Loads:* 30 lb. and 40 lb. loads standard. Heavier loads available when required. *Antenna Loads:* design available to support any combination of microwave equipment.

**RADAR TOWERS**—Types, heights and loads custom-designed to meet any requirement for support of radar equipment. Extensive experience in the design of radar structures for the Government.

**SPECIAL DESIGNS**—Large, experienced engineering staff and well-equipped fabricating plant capable of creating and fabricating towers of any kind, height or type for any requirement.

**TOWER ELEVATORS**—All steel elevator for TV and radio towers, rated for 750 lb. load, radio controlled, completely equipped with automatic safeties.

**TOWER ERECTION AND INSPECTION**—Complete tower erection and inspection service under supervision of graduate engineers.

**DRESSER**

**CRANE, HOIST & TOWER DIVISION**

one of the Dresser Industries  
(formerly Dresser-Idaco Co.)

885 Michigan Ave., Columbus, Ohio 43215  
Phone area 614, 299-2123 • TWX 614-759-0672  
Branch: 2314 Redondo Beach Blvd., Gardena, Calif. 90247

LITTLE JOE ENTERPRISES  
MASTER TOWER CO  
MICROFLECT COMPANY INC.  
PACIFIC TOWER CO  
ROHM MANUFACTURING CO.  
STAINLESS, INC.  
SWAGER TOWER CORPORATION  
UNITED STATES TOWERS  
UP-RIGHT SCAFFOLDS  
UTILITY TOWER CO.

TOWERS, ANTENNA, RECEIVING

ADVANCE INDUSTRIES  
AMECO, INC.  
ANTENNA PRODUCTS COMPANY  
DRESSER CRANE HOIST & TOWER  
FORT WORTH TOWER CO., INC.  
FLINE IRON & STEEL COMPANY  
LIBERTY TOWER MFG. CO  
LITTLE JOE ENTERPRISES  
MASTER TOWER CO  
MICROFLECT COMPANY INC.  
PACIFIC TOWER CO  
ROHM MANUFACTURING CO.  
SINGER PRODUCTS CO  
STAINLESS, INC.  
SWAGER TOWER CORPORATION  
TRYLON INCORPORATED  
UNITED STATES TOWERS  
UP-RIGHT SCAFFOLDS  
UTILITY TOWER CO.

TOWERS, ANTENNA, TRANSMITTING, AM

ADVANCE INDUSTRIES  
ANTENNA PRODUCTS COMPANY  
BLAW-KNOX COMPANY  
CCA ELECTRONICS CORPORATION  
DRESSER CRANE HOIST & TOWER  
FORT WORTH TOWER CO., INC.  
GATES RADIO COMPANY  
JAMPRO ANTENNA COMPANY  
KLINE IRON & STEEL COMPANY  
LIBERTY TOWER MFG. CO  
LITTLE JOE ENTERPRISES  
MASTER TOWER CO  
MICROFLECT COMPANY INC.  
GUNNAR A OLSEN CORP  
PACIFIC TOWER CO  
RCA BROADCAST PRODS.  
ROHM MANUFACTURING CO.  
SINGER PRODUCTS CO  
STAINLESS, INC.  
SWAGER TOWER CORPORATION  
TRYLON INCORPORATED  
UNITED STATES TOWERS  
UP-RIGHT SCAFFOLDS  
UTILITY TOWER CO.  
VISUAL ELECTRONICS CORP

TOWERS, ANTENNA, TRANSMITTING, FM

ADVANCE INDUSTRIES  
ANTENNA PRODUCTS COMPANY  
BLAW-KNOX COMPANY  
CCA ELECTRONICS CORPORATION  
DRESSER CRANE HOIST & TOWER  
FORT WORTH TOWER CO., INC.  
GATES RADIO COMPANY  
JAMPRO ANTENNA COMPANY  
KLINE IRON & STEEL COMPANY  
LIBERTY TOWER MFG. CO  
LITTLE JOE ENTERPRISES  
MASTER TOWER CO  
MICROFLECT COMPANY INC.  
GUNNAR A OLSEN CORP  
PACIFIC TOWER CO  
RCA BROADCAST PRODS.  
ROHM MANUFACTURING CO.  
SINGER PRODUCTS CO  
STAINLESS, INC.  
SWAGER TOWER CORPORATION  
TRYLON INCORPORATED  
UNITED STATES TOWERS  
UP-RIGHT SCAFFOLDS  
UTILITY TOWER CO.  
VISUAL ELECTRONICS CORP

TOWERS, ANTENNA, TRANSMITTING, TV

ADVANCE INDUSTRIES  
ANTENNA PRODUCTS COMPANY  
BLAW-KNOX COMPANY  
DRESSER CRANE HOIST & TOWER  
FORT WORTH TOWER CO., INC.  
GATES RADIO COMPANY  
JAMPRO ANTENNA COMPANY  
KLINE IRON & STEEL COMPANY  
LIBERTY TOWER MFG. CO  
MASTER TOWER CO  
MICROFLECT COMPANY INC.  
GUNNAR A OLSEN CORP  
PACIFIC TOWER CO  
RCA BROADCAST PRODS.  
ROHM MANUFACTURING CO.  
SINGER PRODUCTS CO.  
STAINLESS, INC.  
SWAGER TOWER CORPORATION  
TRYLON INCORPORATED  
UNITED STATES TOWERS  
UP-RIGHT SCAFFOLDS  
UTILITY TOWER CO.  
VISUAL ELECTRONICS CORP

TRANSFORMERS, AUDIO, ISOLATION

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
ALTEC LANSING  
ESSEX WIRE CORPORATION  
GOTHAM AUDIO CORPORATION  
LAFAYETTE RADIO ELECTRONICS  
PERMOFLUX CORPORATION  
RCA BROADCAST PRODS.  
ROHDE & SCHWARZ SALES CO. -USA  
STACO, INC.

TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, AUDIO, MATCHING

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
ALTEC LANSING  
ATLAS SOUND  
ESSEX WIRE CORPORATION  
GENERAL RADIO CO  
GOTHAM AUDIO CORPORATION  
LAFAYETTE RADIO ELECTRONICS  
LAKE ELECTRONICS, INC.  
PERMOFLUX CORPORATION  
RCA BROADCAST PRODS.  
ROHDE & SCHWARZ SALES CO. -USA  
STACO, INC.  
TRW ELECTRONICS  
TV CARLE SUPPLY CO  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, AUDIO, POWER OUTPUT

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
ALTEC LANSING  
ESSEX WIRE CORPORATION  
LAFAYETTE RADIO ELECTRONICS  
LAKE ELECTRONICS, INC.  
MILF'S REPRODUCER CO  
PERMOFLUX CORPORATION  
STACO, INC.  
TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, AUTO

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
ALTEC LANSING  
CRAFTSMAN ELECTRONICS PRODUCTS  
ESSEX WIRE CORPORATION  
GENERAL ELECTRIC CO  
GENERAL RADIO CO  
HUGHEY & PHILLIPS  
LAFAYETTE RADIO ELECTRONICS  
PERMOFLUX CORPORATION  
SINGER PRODUCTS CO.  
SOLA ELECTRIC  
STACO, INC.  
TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, COUPLING

ADC PRODUCTS  
ALTEC LANSING  
ESSEX WIRE CORPORATION  
PERMOFLUX CORPORATION  
TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, FILAMENT

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
ALTEC LANSING  
ENGINEERING ASSOCIATES  
ESSEX WIRE CORPORATION  
GENERAL ELECTRIC CO  
LAFAYETTE RADIO ELECTRONICS  
LAKE ELECTRONICS, INC.  
PERMOFLUX CORPORATION  
SOLA ELECTRIC  
STACO, INC.  
TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, GENERAL

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
ALTEC LANSING  
ANACONDA ASTRODATA CO  
ESSEX WIRE CORPORATION  
G E INDUSTRIAL SALES OPERATION  
GENERAL ELECTRIC CO  
LAFAYETTE RADIO ELECTRONICS  
LAKE ELECTRONICS, INC.  
PERMOFLUX CORPORATION  
SINGER PRODUCTS CO.  
SOLA ELECTRIC  
STACO, INC.  
TRW ELECTRONICS  
TV CARLE SUPPLY CO  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, PLATE

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
ALTEC LANSING  
ESSEX WIRE CORPORATION  
LAKE ELECTRONICS, INC.  
PERMOFLUX CORPORATION  
SOLA ELECTRIC  
STACO, INC.  
TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, POWER

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
ALTEC LANSING  
ENGINEERING ASSOCIATES  
ESSEX WIRE CORPORATION  
GENERAL ELECTRIC CO  
HUGHEY & PHILLIPS  
LAFAYETTE RADIO ELECTRONICS  
LAKE ELECTRONICS, INC.  
PERMOFLUX CORPORATION  
SOLA ELECTRIC  
STACO, INC.  
TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, RF

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
AMERICAN CABLE ELECTRONICS  
ANTENNA PRODUCTS COMPANY

BARKER & WILLIAMSON  
BLONDER-TONGUE LABORATORIES  
CRAFTSMAN ELECTRONICS PRODUCTS  
D & B ELECTRONICS COMPANY  
ESSEX WIRE CORPORATION  
KAPPA NETWORKS, INC.  
LAKE ELECTRONICS, INC.  
MICROLAB / FXR  
J. W. MILLER CO.  
THE TECHNICAL MATERIEL CORP

TRANSFORMERS, TRANSISTOR

ADC PRODUCTS  
ALLIED ELECTRONICS CORP  
ESSEX WIRE CORPORATION  
GOTHAM AUDIO CORPORATION  
LAFAYETTE RADIO ELECTRONICS  
LAKE ELECTRONICS, INC.  
STACO, INC.  
TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

TRANSFORMERS, VARIABLE

ALLIED ELECTRONICS CORP  
ENGINEERING ASSOCIATES  
ESSEX WIRE CORPORATION  
GENERAL ELECTRIC CO  
LAKE ELECTRONICS, INC.  
OHMITZ MANUFACTURING COMPANY  
STACO, INC.  
TRW ELECTRONICS  
UNITED TRANSFORMER COMPANY

TRANSISTORS - SFE SEMICONDUCTORS

AMPLIVISION CORPORATION  
KEITH ANDERSON CO  
RFCO TELEVISION ASSOCIATES  
CATEL COMPANY  
EMCEE  
F & M SYSTEMS COMPANY  
LITTON EDUCATIONAL TELE DIV  
TOWNSEND ASSOCIATES

TRANSMISSION LINES

AMECO, INC.  
ANDREW CORPORATION  
ANTENNA PRODUCTS COMPANY  
COPPERWELD STEEL COMPANY  
GATES RADIO COMPANY  
JAMPRO ANTENNA COMPANY  
JERROLD ELECTRONICS CORP  
MICROWAVE ASSOCIATES, INC.  
NARDA MICROWAVE CORPORATION  
PHELPS DODGE  
RCA BROADCAST PRODS.  
TRYLON INCORPORATED  
VISUAL ELECTRONICS CORP

TRANSMISSION TEST SETS

NARDA MICROWAVE CORPORATION  
PHELPS DODGE  
RCA BROADCAST PRODS.  
RIKER VIDEO INDUSTRIES  
VISUAL ELECTRONICS CORP  
WAVEFORMS, INCORPORATED

TRANSMITTER KITS

ALLIED ELECTRONICS CORP  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
GATES RADIO COMPANY  
E F JOHNSON COMPANY  
MILES REPRODUCER CO  
SINGER PRODUCTS CO

TRANSMITTERS, AM, LOW POWER

BAUER ELECTRONICS CORPORATION  
LOW POWER

TRANSMITTERS, AM, 250 WATT

AMERICAN ELECTRONIC LABS  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
E F JOHNSON COMPANY  
SINGER PRODUCTS CO  
TELETRONIX

TRANSMITTERS, AM, 1KW

AMERICAN ELECTRONIC LABS  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
E F JOHNSON COMPANY  
MARCONI DIVISION  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO  
TELETRONIX  
VISUAL ELECTRONICS CORP  
WILKINSON ELECTRONICS, INC

TRANSMITTERS, AM, 5KW

AMERICAN ELECTRONIC LABS  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
RCA BROADCAST PRODS.  
ROHDE & SCHWARZ SALES CO. -USA  
SINGER PRODUCTS CO  
TELETRONIX  
VISUAL ELECTRONICS CORP  
WILKINSON ELECTRONICS, INC

TRANSMITTERS, AM, 10KW

AMERICAN ELECTRONIC LABS  
AMERICAN ELITE  
BAUER ELECTRONICS CORPORATION

CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
CONTINENTAL ELECTRONICS MFG  
GATES RADIO COMPANY  
MARCONI DIVISION  
RCA BROADCAST PRODS.  
ROHDE & SCHWARZ SALES CO. -USA  
SINGER PRODUCTS CO  
TELETRONIX  
VISUAL ELECTRONICS CORP  
WILKINSON ELECTRONICS, INC

TRANSMITTERS, AM, 25 KW

AMERICAN ELECTRONIC LABS  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
CONTINENTAL ELECTRONICS MFG  
GATES RADIO COMPANY  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO  
VISUAL ELECTRONICS CORP

TRANSMITTERS, AM, 50 KW

AMERICAN ELECTRONIC LABS  
AMERICAN ELITE  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
CONTINENTAL ELECTRONICS MFG  
GATES RADIO COMPANY  
MARCONI DIVISION  
RCA BROADCAST PRODS.  
SINGER PRODUCTS CO  
TELETRONIX  
VISUAL ELECTRONICS CORP

TRANSMITTERS, AM, OVER 50 KW

AMERICAN ELITE  
CCA ELECTRONICS CORPORATION  
CONTINENTAL ELECTRONICS MFG  
GATES RADIO COMPANY  
MARCONI DIVISION  
SINGER PRODUCTS CO

TRANSMITTERS, AM, TO ORDER

EITEL ELECTRONICS

TRANSMITTERS, FM

MILES REPRODUCER CO  
ROHDE & SCHWARZ SALES CO. -USA  
THOMSON ELECTRIC CO

TRANSMITTERS, FM, 10 WATTS

AMERICAN ELECTRONIC LABS  
CCA ELECTRONICS CORPORATION  
GATES RADIO COMPANY  
MARTI ELECTRONICS  
MOSELEY ASSOCIATES INC.  
SINGER PRODUCTS CO

TRANSMITTERS, FM, 50 WATTS

GATES RADIO COMPANY

TRANSMITTERS, FM, 100 WATTS

CCA ELECTRONICS CORPORATION  
MARTI ELECTRONICS  
RMG ELECTRONICS LABORATORY  
SINGER PRODUCTS CO

TRANSMITTERS, FM, 250 WATTS

AMERICAN ELECTRONIC LABS  
CCA ELECTRONICS CORPORATION  
GATES RADIO COMPANY  
SINGER PRODUCTS CO  
STANDARD ELECTRONICS CORP.  
TELETRONIX

TRANSMITTERS, FM, 1 KW

AMERICAN ELECTRONIC LABS  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
MARCONI DIVISION  
RCA BROADCAST PRODS.  
RMG ELECTRONICS LABORATORY  
SINGER PRODUCTS CO  
STANDARD ELECTRONICS CORP.  
TELETRONIX  
WILKINSON ELECTRONICS, INC

TRANSMITTERS, FM, 3 KW

BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
GATES RADIO COMPANY  
TELETRONIX  
VISUAL ELECTRONICS CORP

TRANSMITTERS, FM, 5 KW

AMERICAN ELECTRONIC LABS  
AMERICAN ELITE  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
MARCONI DIVISION  
RCA BROADCAST PRODS  
SINGER PRODUCTS CO  
STANDARD ELECTRONICS CORP.  
TELETRONIX  
VISUAL ELECTRONICS CORP  
WILKINSON ELECTRONICS, INC

TRANSMITTERS, FM, 7.5 KW

AMERICAN ELECTRONIC LABS  
BAUER ELECTRONICS CORPORATION  
GATES RADIO COMPANY  
WILKINSON ELECTRONICS, INC

TRANSMITTERS, FM, 10 KW

AMERICAN ELECTRONIC LABS  
AMERICAN ELITE  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
RCA BROADCAST PRODS

# CONTINENTAL'S TYPE 317C\_\_\_\_\_

Within 18 months following its introduction, Continental had sold 13 Type 317C transmitters. Here's why:

**OVERALL EFFICIENCY:**

62% or better

**PLATE EFFICIENCY:**

80% or better

**POWER CONSUMPTION:**

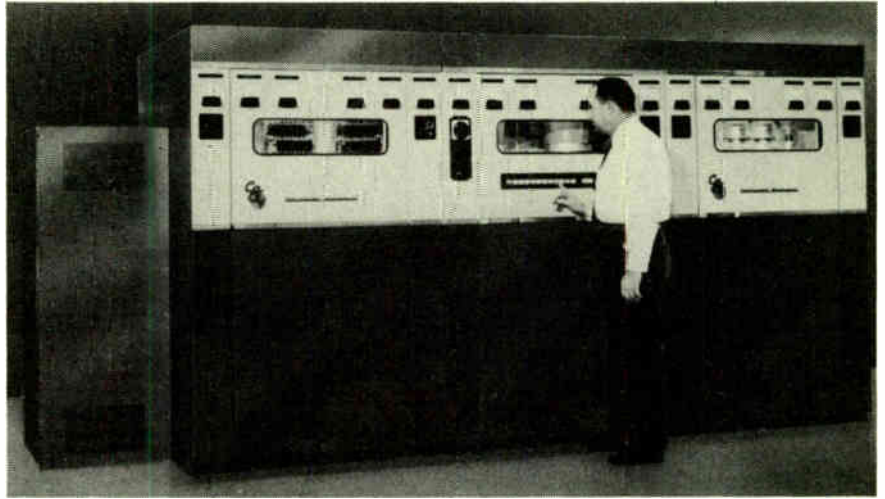
82 kw @ 0 modulation

92 kw @ 30% modulation

120 kw @ 100% modulation

**SELF-CONTAINED:** compact design assures minimum installation cost. The 317C uses only 62 sq. ft. of total floor space. Blower is contained within transmitter cabinet. One neat package for the world's most efficient 50 kw AM broadcast transmitter.

THE WORLD'S MOST EFFICIENT 50KW  
AM BROADCAST TRANSMITTER!

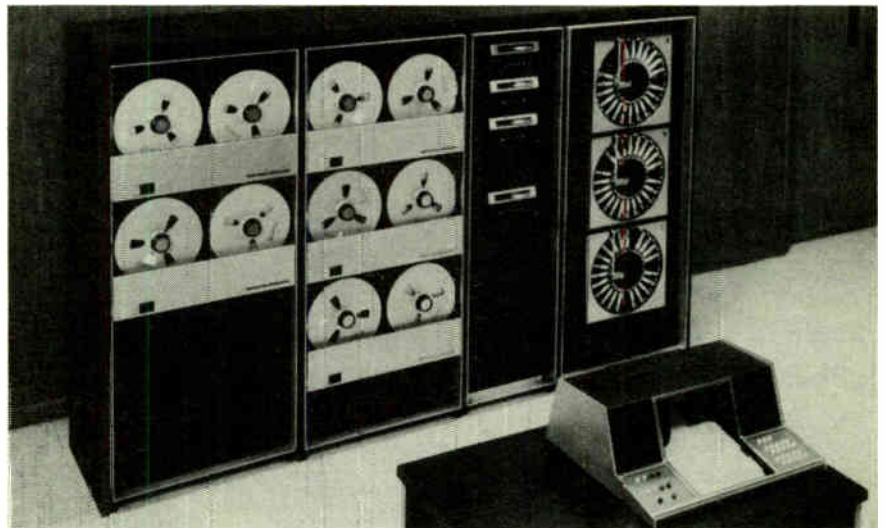


OTHER CONTINENTAL BROADCAST TRANSMITTERS range in power from 5,000 watts to 1,000,000 watts.

## CONTINENTAL'S PROLOG-AUTOMATIC PROGRAMMING & LOGGING AS EASY AS TYPING UP YOUR STATION LOG!

Prolog uses your station log to provide any degree or combination of unattended, automatic or manual-live operation desired. Your log can be prepared on any standard electric typewriter, or you can use any of the auto-typing, IBM punch-card and similar equipment in use today. PROLOG uses your established programming format; nothing changes unless you want to change it. That's PROLOG: simple and flexible!

For additional information on Continental transmitters or PROLOG Systems, write Commercial Sales Dept; Continental Electronics Mfg. Co.; Box 17040, Dallas, Texas 75217



*Continental Electronics*   
A SUBSIDIARY OF **LTV** ELECTROSYSTEMS, INC.

RHG ELECTRONICS LABORATORY  
STANDARD ELECTRONICS CORP.  
TELETRONIX  
VISUAL ELECTRONICS CORP  
WILKINSON ELECTRONICS, INC

TRANSMITTERS, FM, 15 KW  
CCA ELECTRONICS CORPORATION  
GATES RADIO COMPANY

TRANSMITTERS, FM, 20 KW  
AMERICAN ELECTRONIC LABS  
BAUER ELECTRONICS CORPORATION  
CCA ELECTRONICS CORPORATION  
COLLINS RADIO COMPANY  
GATES RADIO COMPANY  
RCA BROADCAST PRODS  
SINGER PRODUCTS CO  
STANDARD ELECTRONICS CORP.  
VISUAL ELECTRONICS CORP  
WILKINSON ELECTRONICS, INC

TRANSMITTERS, FM, 40 KW  
CCA ELECTRONICS CORPORATION  
GATES RADIO COMPANY  
RCA BROADCAST PRODS

TRANSMITTERS, FM, 50 KW  
AMERICAN ELITE

TRANSMITTERS, FM, 100 KW  
AMERICAN ELITE

TRANSMITTERS, FM, TO ORDER  
EITEL ELECTRONICS

TRANSMITTERS, TV  
ROHDE & SCHWARZ SALES CO. -USA  
THOMSON ELECTRIC CO

TRANSMITTERS, TV, 1 WATT  
KEITH ANDERSON CO  
EMCEE

TRANSMITTERS, TV, 10 WATTS  
KEITH ANDERSON CO

TRANSMITTERS, TV, 20 WATTS  
EMCEE

TRANSMITTERS, TV, 60 WATTS  
UTICA CORPORATION

TRANSMITTERS, TV, 100 WATTS  
EMCEE  
GATES RADIO COMPANY

TRANSMITTERS, TV, 500 WATTS  
GATES RADIO COMPANY  
STANDARD ELECTRONICS CORP

TRANSMITTERS, TV, 1 KW  
MARCONE DIVISION  
EMCEE  
SARKES-TARZIAN

TRANSMITTERS, TV, 2 KW  
RCA BROADCAST PRODS

TRANSMITTERS, TV, 3 KW  
TOWNSEND ASSOCIATES

TRANSMITTERS, TV, 5 KW  
GATES RADIO COMPANY  
MARCONE DIVISION  
RCA BROADCAST PRODS  
STANDARD ELECTRONICS CORP.

TRANSMITTERS, TV, 6 KW  
RCA BROADCAST PRODS

TRANSMITTERS, TV, 10 KW  
G E VISUAL COMMUNICATIONS PROD  
MARCONE DIVISION  
STANDARD ELECTRONICS CORP.

TRANSMITTERS, TV, 11.5W  
RCA BROADCAST PRODS

TRANSMITTERS, TV, 12 KW  
RCA BROADCAST PRODS

TRANSMITTERS, TV, 15 KW  
TOWNSEND ASSOCIATES  
VISUAL ELECTRONICS CORP

TRANSMITTERS, TV, 25 KW  
MARCONE DIVISION  
RCA BROADCAST PRODS  
STANDARD ELECTRONICS CORP.

TRANSMITTERS, TV, 30 KW  
G E VISUAL COMMUNICATIONS PROD  
RCA BROADCAST PRODS  
TOWNSEND ASSOCIATES  
VISUAL ELECTRONICS CORP

TRANSMITTERS, TV, 35 KW  
STANDARD ELECTRONICS CORP.

TRANSMITTERS, TV, 50 KW  
G E VISUAL COMMUNICATIONS PROD  
RCA BROADCAST PRODS  
STANDARD ELECTRONICS CORP.

TRANSMITTERS, TV, 55 KW  
TOWNSEND ASSOCIATES  
VISUAL ELECTRONICS CORP

TRANSMITTERS, TV, 70 KW  
STANDARD ELECTRONICS CORP.

TRANSMITTERS, TV, 100 KW  
G E VISUAL COMMUNICATIONS PROD  
TOWNSEND ASSOCIATES

TRANSMITTERS, TV, 150 KW  
RCA BROADCAST PRODS

TRANSMITTERS, TV, TO ORDER  
EITEL ELECTRONICS

TUNING - SEE HARDWARE

TURNABLES, PHONOGRAPH  
BENJAMIN ELECTRONIC SOUND CORP  
DISPLAY TECHNOLOGIES INC  
FAIRCHILD RECORDING EQUIPMENT  
GOTHAM AUDIO CORPORATION  
GRAY RESEARCH & DEVELOPMENT CO  
KOSS ELECTRONICS, INC.  
MARANTZ COMPANY  
Q R K ELECTRONIC PRODUCTS  
RCA BROADCAST PRODS.  
RUSSCO ELECTRONICS MFG.  
SINGER PRODUCTS CO  
SONY CORPORATION OF AMERICA  
SPARTA ELECTRONIC CORPORATION  
TELECTRO INDUSTRIES CORP  
VISUAL ELECTRONICS CORP  
THE SINGER CO - METRICS DIV

TV SYSTEMS, CLOSED CIRCUIT  
AMECO, INC.  
AMERICAN CABLE ELECTRONICS  
AMPEX CORPORATION  
AMPLIVISION CORPORATION  
ANACONDA ASTRODATA CO  
RALL PROTHERS RESEARCH  
BIONIC INSTRUMENTS, INC.  
BLONDER-TONGUE LABORATORIES  
CENTRAL DYNAMICS CORPORATION  
COHU ELECTRONICS  
COLORADO VIDEO  
DAGE RELL CORPORATION  
DIAMOND ELECTRONICS  
DIACRAFT, INC  
F & M SYSTEMS COMPANY  
THE JAMES FLOYD FORD CO  
GRC AMERICA CORPORATION  
G E VISUAL COMMUNICATIONS PROD  
GENERAL ELECTRIC CO  
JERROLD ELECTRONICS CORP  
J M ELECTRONICS COMPANY  
KAISER-COX  
THE KALART COMPANY  
LITTON EDUCATIONAL TELE DIV  
MARCONE DIVISION  
MARYLAND TELECOMMUNICATIONS  
MICRO-LINK SYSTEMS/VARIAN ASSO  
MIRATFL ELECTRONICS, INC  
MVR CORPORATION  
RCA BROADCAST PRODS.  
RIKER VIDEO INDUSTRIES  
SARKES-TARZIAN  
SETCHELL CARLSON INCORPORATED  
SIGMA INDUSTRIES  
SONY CORPORATION OF AMERICA  
SPFNCR-KENNEDY LABORATORIES  
STANDARD ELECTRONICS CORP.  
S. STERLING COMPANY  
SYLVANIA-COMM. ELECTRONICS DIV  
TELEMATION, INC.  
TELEMET COMPANY  
TELEQUIP CORPORATION  
TELEVISION UTILITIES CORP  
TELTRON, INC  
THOMSON ELECTRIC CO

VACUUM TUBES, BALLAST  
AMPERITE CO  
LEWIS AND KAUFMAN, LTD.  
THOR ELECTRONICS

VACUUM TUBES, CAMERA,  
IMAGE-ORTHICON  
AMPEREX ELECTRONIC CORP  
THE ENGLISH ELECTRIC CORP.  
G E PICKUP TUBE OPERATION  
RCA ELECTRONIC COMPONENTS  
TELEQUIP CORPORATION  
TELTRON, INC  
THOR ELECTRONICS  
VISUAL ELECTRONICS CORP  
WESTINGHOUSE ELECTRIC CORP

VACUUM TUBES, CAMERA, PLUMBICON  
AMPEREX ELECTRONIC CORP  
NORTH AMERICAN PHILIPS CO  
VISUAL ELECTRONICS CORP

VACUUM TUBES, CAMERA, VIDICON  
AMPEREX ELECTRONIC CORP  
THE ENGLISH ELECTRIC CORP.  
GBC AMERICA CORPORATION  
G E PICKUP TUBE OPERATION  
LEWIS AND KAUFMAN, LTD.  
NORTH AMERICAN PHILIPS CO  
RCA ELECTRONIC COMPONENTS  
TELEQUIP CORPORATION  
TELEVISION UTILITIES CORP  
THOR ELECTRONICS  
VISUAL ELECTRONICS CORP  
WESTINGHOUSE ELECTRIC CORP

VACUUM TUBES, CATHODE RAY,  
OSCILLOSCOPE  
TEKTRONIX INC

VACUUM TUBES, CATHODE RAY,  
TV, COLOR  
G E DISTRIBUTOR SALES FORCE  
RCA ELECTRONIC COMPONENTS  
SINGER PRODUCTS CO.  
THOR ELECTRONICS  
WESTINGHOUSE ELECTRIC CORP

VACUUM TUBES, CATHODE RAY,  
TV, MONOCHROME  
AMERICAN ELITE  
CONRAC  
G E DISTRIBUTOR SALES FORCE

LEWIS AND KAUFMAN, LTD.  
RCA ELECTRONIC COMPONENTS  
SINGER PRODUCTS CO.  
THOR ELECTRONICS  
WESTINGHOUSE ELECTRIC CORP

VACUUM TUBES, RECEIVING  
AMERICAN ELITE  
AMPEREX ELECTRONIC CORP  
CALVERT ELECTRONICS  
G E DISTRIBUTOR SALES FORCE  
HEINITZ & KAUFMAN, LTD  
LEWIS AND KAUFMAN, LTD.  
MICROWAVE ASSOCIATES, INC.  
RCA ELECTRONIC COMPONENTS  
SINGER PRODUCTS CO.  
TELEQUIP CORPORATION  
THOR ELECTRONICS  
WESTINGHOUSE ELECTRIC CORP

VACUUM TUBES, TRANSMITTING  
AMECO, INC.  
AMERICAN ELITE  
AMPEREX ELECTRONIC CORP  
CALVERT ELECTRONICS  
CCA ELECTRONICS CORPORATION  
EIMAC DIVISION OF VARIAN  
THE ENGLISH ELECTRIC CORP.  
G E DISTRIBUTOR SALES FORCE  
HEINITZ & KAUFMAN, LTD  
JOA CARTRIDGE SERVICE  
LEWIS AND KAUFMAN, LTD.  
THE MACHLETT LABORATORIES  
MICROWAVE ASSOCIATES, INC.  
RCA ELECTRONIC COMPONENTS  
THOR ELECTRONICS  
WESTINGHOUSE ELECTRIC CORP

VESTIGIAL SIDEBAND FILTERS  
ALFORD MANUFACTURING COMPANY  
G E VISUAL COMMUNICATIONS PROD  
JAMPRO ANTENNA COMPANY  
VISUAL ELECTRONICS CORP

VOLTMETERS, AC  
ALLIED ELECTRONICS CORP  
API INSTRUMENTS CO.  
COHU ELECTRONICS  
COLUMBIA ELECTRIC MFG CO  
DATA INSTRUMENT DIVISION  
ENGINEERING ASSOCIATES  
G E INDUSTRIAL SALES OPERATION  
GENERAL ELECTRIC CO  
GENTRAL RADIO CO  
GOTHAM AUDIO CORPORATION  
HEATH CO  
HEWLETT-PACKARD CO.  
HICKOK ELECTRICAL INSTRUMENT  
INSTRUMENT LABORATORIES CORP  
MOTOROLA COMMUNICATIONS  
RCA ELECTRONIC COMPONENTS  
ROHDE & SCHWARZ SALES CO. -USA  
THE SINGER CO - METRICS DIV  
TEXAS ELECTRONICS  
TRIPLETT ELECTRICAL INSTRUMENT  
WABER ELECTRONICS, INC.  
WAVEFORMS, INCORPORATED  
YOKOGAWA ELECTRIC WORKS

VOLTMETERS, DC  
ALLIED ELECTRONICS CORP  
API INSTRUMENTS CO.  
COHU ELECTRONICS  
COLUMBIA ELECTRIC MFG CO  
DATA INSTRUMENT DIVISION  
ENGINEERING ASSOCIATES  
G E INDUSTRIAL SALES OPERATION  
GENERAL ELECTRIC CO  
GENERAL RADIO CO  
HEATH CO  
HEWLETT-PACKARD CO.  
HICKOK ELECTRICAL INSTRUMENT  
MOTOROLA COMMUNICATIONS  
RCA ELECTRONIC COMPONENTS  
ROHDE & SCHWARZ SALES CO. -USA  
THE SINGER CO - METRICS DIV  
TEXAS ELECTRONICS  
TRIPLETT ELECTRICAL INSTRUMENT  
YOKOGAWA ELECTRIC WORKS

VOLTMETERS, VACUUM TUBE  
COHU ELECTRONICS  
ENGINEERING ASSOCIATES  
GENERAL RADIO CO  
HEATH CO  
HEWLETT-PACKARD CO.  
HICKOK ELECTRICAL INSTRUMENT  
INSTRUMENT LABORATORIES CORP  
RCA ELECTRONIC COMPONENTS  
ROHDE & SCHWARZ SALES CO. -USA  
TRIPLETT ELECTRICAL INSTRUMENT  
WAVEFORMS, INCORPORATED  
BENRUS

WATTMETERS  
F W BELL, INC  
BIRD ELECTRONIC CORPORATION  
ENGINEERING ASSOCIATES  
G E INDUSTRIAL SALES OPERATION  
GENERAL ELECTRIC CO  
GENERAL MICROWAVE CORPORATION  
MOTOROLA COMMUNICATIONS  
RCA BROADCAST PRODS.  
ROHDE & SCHWARZ SALES CO. -USA  
THE SINGER CO - METRICS DIV  
STANDARD ELECTRONICS CORP.  
TRIPLETT ELECTRICAL INSTRUMENT  
WATERS MANUFACTURING  
YOKOGAWA ELECTRIC WORKS

WAVEGUIDE AND ASSOCIATED  
COMPONENTS  
ANDREW CORPORATION  
CARDWELL CONDENSER CORP  
COOK ELECTRIC COMPANY

D & B ELECTRONICS COMPANY  
DEMORNAY - BDNARDI DIVISION  
GENERAL MICROWAVE CORPORATION  
HEWLETT-PACKARD CO.  
JERROLD ELECTRONICS CORP  
MICROLAB / FXR  
MICRO-LINK SYSTEMS/VARIAN ASSO  
MICROWAVE ASSOCIATES, INC.  
PHELPS DODGE  
RCA BROADCAST PRODS.  
SCIENTIFIC-ATLANTA  
TECHNICAL APPLIANCE CORP

WEATHER INSTRUMENTS  
AMECO, INC.  
BECKMAN & WHITLEY  
BLONDER-TONGUE LABORATORIES  
TELSIS CORPORATION  
TEXAS ELECTRONICS

WINDERS, CARTRIDGE  
BROADCAST ELECTRONICS, INC

WIRE, BARE, COPPER  
ALLIED ELECTRONICS CORP  
ALPHA WIRE  
AMECO, INC.  
BELDEN MANUFACTURING CO  
BIRNBACH CO  
CCA ELECTRONICS CORPORATION  
JAMPRO ANTENNA COMPANY  
PACIFIC TOWER CO  
RCA BROADCAST PRODS.  
ROBINS INDUSTRIES CORP.  
SAXTON PRODUCTS  
SWAGER TOWER CORPORATION  
UTILITY TOWER CO.

WIRE, BARE, COPPER STRAP  
ALPHA WIRE  
CCA ELECTRONICS CORPORATION  
JAMPRO ANTENNA COMPANY  
RCA BROADCAST PRODS.  
SAXTON PRODUCTS  
SWAGER TOWER CORPORATION  
UTILITY TOWER CO.

WIRE, BARE, STEEL  
COPPERWELD STEEL COMPANY  
SAXTON PRODUCTS

WIRE, INSULATED, HIGH VOLTAGE  
ALPHA WIRE  
BELDEN MANUFACTURING CO  
BIRNBACH CO  
BOSTON INSULATED WIRE & CABLE  
ITT WIRE & CABLE DIVISION  
LENZ ELECTRIC MANUFACTURING CO  
SAXTON PRODUCTS  
SINGER PRODUCTS CO.  
TENSOLITE INSULATED WIRE CO.

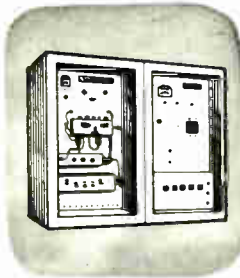
WIRE, INSULATED, HOOKUP  
ALLIED ELECTRONICS CORP  
ALPHA WIRE  
BELDEN MANUFACTURING CO  
BIRNBACH CO  
ITT WIRE & CABLE DIVISION  
LENZ ELECTRIC MANUFACTURING CO  
ROBINS INDUSTRIES CORP.  
SAXTON PRODUCTS  
SUPERIOR CABLE CORPORATION  
TENSOLITE INSULATED WIRE CO.

WIRE, SHIELDED  
ALLIED ELECTRONICS CORP  
ALPHA WIRE  
BELDEN MANUFACTURING CO  
BIRNBACH CO  
BOSTON INSULATED WIRE & CABLE  
ITT WIRE & CABLE DIVISION  
LENZ ELECTRIC MANUFACTURING CO  
RCA BROADCAST PRODS.  
ROBINS INDUSTRIES CORP.  
SAXTON PRODUCTS  
SINGER PRODUCTS CO.  
TELEQUIP CORPORATION  
TENSOLITE INSULATED WIRE CO.

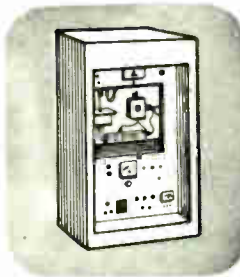
WIRING & CABLING SERVICES  
ALPHA WIRE  
AMECO, INC.  
APPLIED ELECTRO-MECHANICS  
AUDIO ACCESSORIES  
BOSTON INSULATED WIRE & CABLE  
D & B ELECTRONICS COMPANY  
IAT CANNON ELECTRIC  
PALL TRINITY MICRO CORP  
SAXTON PRODUCTS  
TENSOLITE INSULATED WIRE CO.  
VITRO ELECTRONICS

YOKES, DEFLECTION  
AMERICAN ELITE  
LAKE ELECTRONICS, INC.  
SINGER PRODUCTS CO.  
TELEQUIP CORPORATION

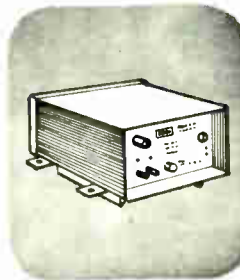
**NEW** FROM **EMCEE**



**1KW  
TRANSLATOR**  
UHF



**1KW  
TRANSMITTER**  
UHF



**1 WATT  
TRANSISTORIZED  
TRANSLATOR**  
VHF ONLY

Send for full details . . . now



**Electronics Missiles and Communications Inc.**

160 EAST THIRD STREET, MT. VERNON, NEW YORK 10550

TELEPHONE: (914) 668-3012

# Collins could sell FM transmitters for 20% less



## BUT then they wouldn't be the best in the world

All Collins transmitters could be sold for less.

- Corners could be cut on transformers (narrowing safety margins for continuous operation).
- Less shielding could be used against spurious radiation (sacrificing some degree of stability).
- Standards on components, wiring, cabling and switches could be lowered.
- Collins' rigid testing could be bypassed.
- Meeting proper load conditions could be left to luck.
- Money devoted to research and development could be saved.
- Collins' 2-year warranty could be cut to the 1-year period of other manufacturers.

All these compromises could lower the price—as well as the *quality, performance* and *reliability* of the product—about 20%. But then Collins transmitters wouldn't be known for their careful engineering, conservatively-rated components, and precision manufacturing techniques.

Collins gives the broadcaster a discount in the form of quality and service. And that's worth a lot more than 20%.

For technical information on any FM transmitter ranging from 250w to 20kw, contact Collins Radio Company, Broadcast Communication Division, Dallas, Texas. Area Code 214, AD 5-9511.

COMMUNICATION / COMPUTATION / CONTROL



COLLINS RADIO COMPANY / DALLAS, TEXAS • CEDAR RAPIDS, IOWA • NEWPORT BEACH, CALIFORNIA • TORONTO, ONTARIO  
Bangkok • Beirut • Frankfurt • Hong Kong • Kuala Lumpur • Los Angeles • London • Melbourne • Mexico City • New York • Paris • Rome • Washington • Wellington





# GUIDE TO MANUFACTURERS

A listing of over 450 manufacturers active in the broadcast industry.  
For a specific product, see Product Directory.

**ACME FILM & VIDEOTAPE LABS.**  
FILM, PROCESSING SERVICE

**ACME VISIBLE RECORDS**  
CABINETS, METAL  
CABINETS, STORAGE, DISC  
CABINETS, STORAGE, FILM  
CABINETS, STORAGE,  
MAGNETIC TAPE  
COMPUTER SERVICES  
DESIGNATION CARDS & STRIPS  
LOG BOOKS OF SHEETS  
TERMINAL CARDS

**ADC PRODUCTS**  
COILS, CHOKES, AF  
COILS, HYBRID  
COILS, TELEPHONE  
COROS, PATCH  
FILTERS, AUDIO  
FILTERS, RF

INDUCTANCES, FIXED  
JACK PANEL ASSEMBLIES  
JACKS  
LAMP, PANEL  
PLUGS, COAXIAL  
PLUGS, PHONE  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC  
TERMINAL BLOCKS  
TERMINAL BOARDS  
TERMINAL STRIPS  
TRANSFORMERS, AUDIO,  
ISOLATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, AUDIO,  
POWER OUTPUT  
TRANSFORMERS, AUTO  
TRANSFORMERS, COUPLING  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
TRANSFORMERS, PLATE  
TRANSFORMERS, POWER  
TRANSFORMERS, RF  
TRANSFORMERS, TRANSISTOR

**AIR SPACE DEVICES, INC.**  
SAFETY DEVICES, CLIMBING

**ADVANCE INDUSTRIES**  
ANCHORS, GUY  
ANTENNAS, AM  
ANTENNAS, CATV  
ANTENNAS, MICROWAVE  
HARDWARE, MOUNTS  
REFLECTORS, PASSIVE  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM

TOWERS, ANTENNA,  
TRANSMITTING, TV

**AEROVOX CORP.**  
BOXES, DECADE, CAPACITOR  
BOXES, DECADE, INDUCTOR  
BOXES, DECADE, RESISTOR  
CAPACITORS, FIXED, CERAMIC  
CAPACITORS, FIXED,  
ELECTROLYTIC  
CAPACITORS, FIXED, FILM  
CAPACITORS, FIXED, METALLIZED  
CAPACITORS, FIXED, MICA  
CAPACITORS, FIXED, OIL-FILLED  
CAPACITORS, FIXED, PAPER  
CAPACITORS, FIXED, OTHER  
DEMAGNETIZERS, BULK TAPE  
FILTERS, AUDIO  
FILTERS, RF  
INTEGRATED CIRCUITS  
KITS  
RESISTORS, FIXED, CARBON  
RESISTORS, FIXED, PRECISION  
RESISTORS, FIXED, OTHER  
SOCKETS, TUBE  
TERMINALS, SOLDERLESS  
TOOLS, CRIMPERS

**AITKEN COMMUNICATIONS**  
AUTOMATION EQUIPMENT  
PREAMPLIFIERS, AUDIO

**ALBION OPTICAL COMPANY**  
LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
METERS, FLUTTER & WOW  
REMOTE CONTROL SYSTEMS

**ALFORD MANUFACTURING COMPANY**  
ANTENNAS, FM  
ANTENNAS, TV  
ANTENNAS, 2500 MHZ  
BRIDGES  
DIPLEXERS  
DIVIDERS, POWER  
MICROWAVE COMPONENTS  
NETWORKS, MATCHING, RF  
SLOTTED SECTIONS  
SWITCHES, COAXIAL  
VEGETIGIAL SIDEBAND FILTERS

**ALLIED ELECTRONICS CORP.**  
AMMETERS, AC  
AMMETERS, DC  
AMPLIFIER, AF, STEREO  
ANTENNAS, FM  
ANTENNAS, TV  
CABINETS, METAL  
CABLE, ARMORED  
CABLE, SHIELDED, AUDIO  
KITS  
OSCILLOSCOPES  
RECEIVERS, AM

RECEIVERS, FM  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RELAYS, GENERAL PURPOSE  
TAPE, MAGNETIC RECORDING,  
AUDIO  
TESTERS, VACUUM TUBE  
TRANSFORMERS, AUDIO,  
ISOLATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, AUDIO,  
POWER OUTPUT  
TRANSFORMERS, AUTO  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
TRANSFORMERS, PLATE  
TRANSFORMERS, POWER  
TRANSFORMERS, RF  
TRANSFORMERS, TRANSISTOR  
TRANSFORMERS, VARIABLE  
TRANSMITTER KITS  
VOLTMETERS, AC  
VOLTMETERS, DC  
WIRE, BARE, COPPER  
WIRE, INSULATED, HOOKUP  
WIRE, SHIELDED

**ALMA ENGINEERING**

AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, STEREO  
AMPLIFIER, BRIDGING  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, TV, VIDEO  
AMPLIFIER, VIDEO, SWEEP  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, VIDEO, PORTABLE  
CONSOLE, VIDEO, STUDIO  
GENERATORS, SIGNAL,  
SPECIAL EFFECTS  
POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO  
SWITCHES  
SWITCHING MATRIXES  
SWITCHING SYSTEMS

**ALPHA WIRE**

CABLE, ARMORED  
CABLE, ASSEMBLIES  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
CABLE, DIRECT-BURIAL  
CABLE, SHIELDED, AUDIO  
CABLE, TELEPHONE  
WIRE, BARE, COPPER  
WIRE, BARE, COPPER STRAP

WIRE, INSULATED, HIGH VOLTAGE  
WIRE, INSULATED, HOOKUP  
WIRE, SHIELDED  
WIRING AND CABLING SERVICES

**ALTEC LANSING**

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, PEAK LIMITING, AM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, STEREO  
AMPLIFIER, BRIDGING  
AMPLIFIER, DC  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
BRIDGES  
CAPACITORS, FIXED, METALLIZED  
CAPACITORS, FIXED, MICA  
CAPACITORS, FIXED, OIL-FILLED  
CAPACITORS, FIXED, PAPER  
CAPACITORS, FIXED, OTHER  
CAPACITORS, VARIABLE  
COILS, CHOKES, AF  
COILS, CHOKES, RF  
COILS, HYBRID  
COILS, TELEPHONE  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, CABINETS  
AND HARDWARE  
CONSOLE, AUDIO, AM  
CONVERTERS  
ENCLOSURES, SPEAKER  
EQUALIZERS, AUDIO EMPHASIS  
FILTERS, AUDIO  
FILTERS, OTHER  
INVERTERS, DC TO AC, CHOPPER  
INVERTERS, DC TO AC,  
SOLID STATE  
INVERTERS, DC TO AC,  
VIBRATORS  
METERS, DB AND VU  
METERS, DB AND VU, WIDE RANGE  
MICROPHONE HARDWARE  
MICROPHONE STANDS & BOOMS  
MICROPHONES, CONDENSER

MICROPHONES, DYNAMIC  
 MONITORS, AM SYSTEMS  
 MONITORS, FM SYSTEMS, MONO  
 NETWORKS, MATCHING, AUDIO  
 POTENTIOMETERS, WIREWOUND  
 POWER SUPPLIES, AC  
 POWER SUPPLIES, DC  
 POWER SUPPLIES, PRECISION  
 PREAMPLIFIERS, AUDIO  
 RECEIVERS, FM  
 REGULATORS, VOLTAGE  
 SOUND SYSTEMS, OUTDOOR  
 SOUND SYSTEMS, PORTABLE  
 SOUND SYSTEMS, THEATER  
 SPEAKER COMPONENTS  
 SPEAKERS  
 SWITCHES, MULTICONTACT  
 SWITCHES, ROTARY  
 TELEPHONE EQUIPMENT  
 TRANSFORMERS, AUDIO,  
 ISOLATION  
 TRANSFORMERS, AUDIO, MATCHING  
 TRANSFORMERS, AUDIO,  
 POWER OUTPUT  
 TRANSFORMERS, AUTO  
 TRANSFORMERS, COUPLING  
 TRANSFORMERS, FILAMENT  
 TRANSFORMERS, GENERAL  
 TRANSFORMERS, PLATE  
 TRANSFORMERS, POWER

**AMECO, INC.**

ADAPTERS, CONNECTOR  
 ADAPTERS, TEST  
 AMPLIFIER, AF, AGC  
 AMPLIFIER, BRIDGING  
 AMPLIFIER, CATV  
 AMPLIFIER, DISTRIBUTION  
 AMPLIFIER, RF,  
 GENERAL PURPOSE  
 AMPLIFIER, TV, BOOSTER  
 ANCHORS, GUY  
 ANTENNAS, CATV  
 ANTENNAS, FM  
 ANTENNAS, MICROWAVE  
 ANTENNAS, TV,  
 MASTER-COMMUNITY  
 ATTENUATORS, AUDIO  
 ATTENUATORS,  
 IMPEDANCE MATCHING  
 ATTENUATORS, MICROWAVE  
 ATTENUATORS, RF  
 ATTENUATORS, VIDEO  
 AUTOMATION EQUIPMENT  
 BACKGROUND MUSIC SERVICE  
 BALUNS  
 BLOWERS AND FANS  
 BRIDGES  
 BROADCAST PROGRAMMING SERVICE  
 CABINETS, METAL  
 CABLE, ASSEMBLIES  
 CABLE, CATV, HARDWARE  
 CABLE, COAXIAL, FLEXIBLE  
 CABLE, DIRECT-BURIAL  
 CABLE, TELEPHONE  
 CAMERA, MOUNTING EQUIPMENT  
 CAMERA, REMOTE  
 CONTROL EQUIPMENT  
 CAMERAS, FILM, CINE  
 CAMERAS, OSCILLOSCOPE  
 CAMERAS, TV, COLOR  
 CAMERAS, TV, MONOCHROME  
 CATV EQUIPMENT - ALSO SEE  
 OTHER CATEGORIES  
 CATV, CABLE TERMINALS  
 CATV, CHANNEL AMPLIFIERS  
 CATV, HEAD-END EQUIPMENT  
 CATV, ORIGINATION EQUIPMENT  
 CIRCUITS, PRINTED  
 CLAMPS, CABLE  
 CLAMPS, GROUND  
 CONNECTORS, ANTENNA  
 CONNECTORS, COAXIAL CABLE  
 CONNECTORS, POWER  
 CONNECTORS, RF  
 CONVERTERS  
 COUPLERS  
 DEMODULATORS  
 FILTERS, ANTENNA  
 FILTERS, RF  
 GENERATORS, SIGNAL, RF  
 HARDWARE, GENERAL  
 HARDWARE, TOOLS  
 HEAD-END EQUIPMENT,  
 SEE CATV HEAD-END EQUIPMENT  
 LENSES, OPTICAL, FIXED  
 LENSES, OPTICAL, ZOOM  
 LIGHTNING ARRESTERS  
 MAINTENANCE SERVICES,  
 MICROWAVE  
 MICROPHONE HARDWARE  
 MICROWAVE COMPONENTS  
 MICROWAVE SYSTEMS, STL  
 MODULATORS, TV  
 MONITORS, FM SYSTEMS, MONO  
 MONITORS, FM SYSTEMS, STEREO  
 MONITORS, FREQUENCY  
 MONITORS, VIDEO  
 MOUNTS, ANTENNA, FIXED  
 NARROW-BAND FM EQUIPMENT  
 NETWORKS, MATCHING, RF  
 PLUGS, COAXIAL  
 POLE CLIMBING EQUIPMENT  
 POWER SUPPLIES, AC  
 POWER SUPPLIES, DC  
 PREAMPLIFIERS, AUDIO  
 PREAMPLIFIERS, VIDEO  
 RACKS, MOUNTING  
 RECEIVERS, FM  
 RECEIVERS, TV, COLOR  
 RECEIVERS, TV, MONOCHROME  
 SWITCHERS  
 TAPE, MAGNETIC RECORDING,  
 VIDEO  
 TOOLS, CLAMPS  
 TOOLS, CRIMPERS

TOWERS, ANTENNA,  
 CATV, HEAD-END  
 TOWERS, ANTENNA, RECEIVING  
 TRANSMISSION LINES  
 TV SYSTEMS, CLOSED CIRCUIT  
 VACUUM TUBES, TRANSMITTING  
 WEATHER INSTRUMENTS  
 WIRE, BARE, COPPER  
 WIRING AND CABLING SERVICES

**AMERICAN CABLE ELECTRONICS**

ADAPTERS, CONNECTOR  
 CATV EQUIPMENT - ALSO SEE  
 OTHER CATEGORIES  
 CATV, ORIGINATION EQUIPMENT  
 CONNECTORS, COAXIAL CABLE  
 TRANSFORMERS, RF  
 TV SYSTEMS, CLOSED CIRCUIT

**AMERICAN ELECTRONIC LABS**

AMPLIFIER, CATV  
 AMPLIFIER, RF, POWER  
 ANTENNAS, MICROWAVE  
 ANTENNAS, 2500 MHZ  
 BALUNS  
 CATV EQUIPMENT - ALSO SEE  
 OTHER CATEGORIES  
 CATV, CHANNEL AMPLIFIERS  
 CATV, HEAD-END EQUIPMENT  
 CATV, ORIGINATION EQUIPMENT  
 COMMUNICATIONS SYSTEMS,  
 MICROWAVE  
 DUMMY LOAD  
 EXCITERS, FM  
 GENERATORS, FM, STEREO  
 FILTERS, RF  
 GENERATORS, FM, SUBCARRIER  
 HEAD-END EQUIPMENT,  
 SEE CATV HEAD-END EQUIPMENT  
 MAINTENANCE SERVICES, AM  
 MAINTENANCE SERVICES, FM  
 MAINTENANCE SERVICES,  
 MICROWAVE  
 NETWORKS, PHASING  
 RECEIVERS, HF  
 SEMICONDUCTOR DIODES  
 SWITCHES, COAXIAL  
 SWITCHES, WAVEGUIDE  
 TESTERS, SEMICONDUCTOR  
 TRANSMITTERS, AM, 250 WATT  
 TRANSMITTERS, AM, 1 KW  
 TRANSMITTERS, AM, 5 KW  
 TRANSMITTERS, AM, 10 KW  
 TRANSMITTERS, AM, 25 KW  
 TRANSMITTERS, AM, 50 KW  
 TRANSMITTERS, FM, 10 WATTS  
 TRANSMITTERS, FM, 250 WATTS  
 TRANSMITTERS, FM, 1 KW  
 TRANSMITTERS, FM, 5 KW  
 TRANSMITTERS, FM, 7.5 KW  
 TRANSMITTERS, FM, 10 KW  
 TRANSMITTERS, FM, 20 KW

**AMERICAN ELITE**

CAPACITORS, FIXED, CERAMIC  
 CAPACITORS, FIXED,  
 ELECTROLYTIC  
 CAPACITORS, FIXED, FILM  
 CAPACITORS, VARIABLE  
 COILS, DEFLECTION  
 AND FOCUSING  
 COMMUNICATIONS SYSTEMS,  
 INTERCOM, WIRED  
 COMMUNICATIONS SYSTEMS,  
 LAND MOBILE  
 COMMUNICATIONS SYSTEMS,  
 MICROWAVE  
 COMMUNICATIONS SYSTEMS,  
 MULTIPLEX  
 CONSOLE, AUDIO, RECORDING  
 INTEGRATED CIRCUITS  
 MICROPHONES, CONDENSER  
 MICROPHONES, DYNAMIC  
 MICROWAVE COMPONENTS  
 MICROWAVE SYSTEMS, 2500 MHZ  
 MOBILE EQUIPMENT  
 POTENTIOMETERS, CARBON  
 RECEIVERS, AM  
 RECEIVERS, FM  
 RECEIVERS, HF  
 RECORDERS, MAGNETIC TAPE,  
 AUDIO  
 RECTIFIERS, SELENIUM  
 RELAYS, LATCHING  
 RESISTORS, FIXED, CARBON  
 SEMICONDUCTOR DIODES  
 SEMICONDUCTORS,  
 TRANSISTORS, AF  
 SEMICONDUCTORS,  
 TRANSISTORS, RF  
 SPEAKERS  
 SWITCHES, PUSHBUTTON,  
 NONILLUMINATED  
 SWITCHES, ROTARY  
 SWITCHES, SLIDE  
 SWITCHES, TOGGLE  
 TELEPHONE EQUIPMENT  
 TRANSMITTERS, AM, 10 KW  
 TRANSMITTERS, AM, 50 KW  
 TRANSMITTERS, AM, OVER 50 KW  
 TRANSMITTERS, FM, 5 KW  
 TRANSMITTERS, FM, 10 KW  
 TRANSMITTERS, FM, 50 KW  
 TRANSMITTERS, FM, 100 KW  
 VACUUM TUBES, CATHODE RAY  
 TV, MONOCHROME  
 VACUUM TUBES, RECEIVING  
 VACUUM TUBES, TRANSMITTING  
 YOKES, DEFECTION

**AMERICAN GELOSO ELECTRONICS**

COMMUNICATIONS SYSTEMS,  
 INTERCOM, WIRED  
 MICROPHONE HARDWARE  
 MICROPHONE STANDS & BOOMS  
 MICROPHONES, DYNAMIC

MICROPHONES, WIRELESS  
 MIXERS - ALSO SEE CONSOLES  
 MOBILE EQUIPMENT  
 RECORDERS, MAGNETIC TAPE,  
 AUDIO  
 SOUND SYSTEMS, OUTDOOR  
 SOUND SYSTEMS, PORTABLE  
 SPEAKER COMPONENTS  
 SPEAKERS  
 TAPE, MAGNETIC RECORDING,  
 AUDIO

**AMERICAN PAMCOR, INC.**

CATV, CABLE TERMINALS  
 CONNECTORS, ANTENNA  
 CONNECTORS, COAXIAL CABLE  
 CONNECTORS, POWER  
 CONNECTORS, RF  
 PLUGS, COAXIAL  
 SWITCHERS  
 SWITCHING MATRIXES  
 SWITCHING SYSTEMS  
 TERMINAL BLOCKS  
 TERMINALS, HIGH VOLTAGE  
 TERMINALS, LUG  
 TERMINALS, SOLDERLESS  
 TOOLS, CRIMPERS

**AMERLINE CORPORATION**

CARTRIDGES, MAGNETIC TAPE  
 REELS, FILM  
 REELS, TAPE

**AMPEREX ELECTRONIC CORP.**

CAPACITORS, FIXED,  
 ELECTROLYTIC  
 CAPACITORS, FIXED, FILM  
 CAPACITORS, FIXED, OTHER  
 CAVITIES, MICROWAVE  
 MICROWAVE COMPONENTS  
 RESISTORS, FIXED, CARBON  
 RESISTORS, FIXED, OTHER  
 SEMICONDUCTOR DIODES  
 SEMICONDUCTOR RECTIFIERS,  
 SILICON CONTROLLED - SCR  
 SEMICONDUCTORS, THYRISTORS  
 SEMICONDUCTORS,  
 TRANSISTORS, AF  
 SEMICONDUCTORS,  
 TRANSISTORS, FE  
 SEMICONDUCTORS, TRANSISTORS,  
 GENERAL  
 SEMICONDUCTORS,  
 TRANSISTORS, RF  
 VACUUM TUBES, CAMERA,  
 IMAGE-ORTHICON  
 VACUUM TUBES, CAMERA,  
 PLUMBICON R  
 VACUUM TUBES, CAMERA, VIDICON  
 VACUUM TUBES, RECEIVING  
 VACUUM TUBES, TRANSMITTING

**AMPERITE CO.**

RELAYS, TIME DELAY  
 VACUUM TUBES, BALLAST

**AMPEX CORPORATION**

CAMERAS, TV, COLOR  
 CAMERAS, TV, MONOCHROME  
 CARTRIDGES, TAPE,  
 RECORDING SERVICE  
 CATV, ORIGINATION EQUIPMENT  
 COMMUNICATIONS SYSTEMS,  
 LAND MOBILE  
 COMPUTER EQUIPMENT  
 CONSOLE, AUDIO, AM  
 CONSOLE, AUDIO, FM  
 CONSOLE, AUDIO, PORTABLE  
 CONSOLE, AUDIO, RECORDING  
 CONSOLE, AUDIO, TV  
 CONSOLE, KIITS  
 CONSOLE, VIDEO, PORTABLE  
 CONSOLE, VIDEO, STUDIO  
 DEMAGNETIZERS, BULK TAPE  
 DEMAGNETIZERS, HEAD  
 DROPOUT COMPENSATOR,  
 VIDEO TAPE  
 EARPHONES, HEADPHONES  
 EDITORS, AUDIO TAPE  
 EDITORS, VIDEO TAPE  
 HEADS, ERASE, MAGNETIC  
 HEADS, RECORDING, MAGNETIC  
 INDUSTRIAL TV  
 LENSES, OPTICAL, FIXED  
 LENSES, OPTICAL, ZOOM  
 MAINTENANCE SERVICES, AM  
 MAINTENANCE SERVICES, FM  
 MAINTENANCE SERVICES, TV  
 MICROPHONES, DYNAMIC  
 MOBILE EQUIPMENT  
 MONITORS, VIDEO  
 RECORDERS, DISC, MAGNETIC  
 RECORDERS, MAGNETIC TAPE,  
 AUDIO  
 RECORDERS, MAGNETIC TAPE,  
 LOGGING  
 RECORDERS, MAGNETIC TAPE,  
 VIDEO  
 SOUND SYSTEMS, OUTDOOR  
 SOUND SYSTEMS, PORTABLE  
 SOUND SYSTEMS, THEATER  
 SPEAKERS  
 TAPE DECKS, MAGNETIC  
 TAPE DUPLICATORS  
 TAPE, MAGNETIC RECORDING,  
 AUDIO  
 TAPE, MAGNETIC RECORDING,  
 COMPUTER  
 TAPE, MAGNETIC RECORDING,  
 TEST  
 TAPE, MAGNETIC RECORDING,  
 VIDEO  
 TV SYSTEMS, CLOSED CIRCUIT

**ANACONDA ASTRODATA CO.**

AMPLIFIER, BRIDGING  
 AMPLIFIER, CATV  
 AMPLIFIER, DISTRIBUTION  
 AMPLIFIER, TV, BOOSTER  
 CABLE, CATV, HARDWARE  
 CABLE, COAXIAL, FLEXIBLE  
 CABLE, DIRECT-BURIAL  
 CATV EQUIPMENT - ALSO SEE  
 OTHER CATEGORIES  
 CATV, CABLE TERMINALS  
 CATV, CHANNEL AMPLIFIERS  
 CATV, HEAD-END EQUIPMENT  
 CONNECTORS, COAXIAL CABLE  
 HEAD-END EQUIPMENT,  
 SEE CATV HEAD-END EQUIPMENT  
 INDUSTRIAL TV  
 METERS, FIELD STRENGTH  
 POWER SUPPLIES, AC  
 TRANSFORMERS, GENERAL  
 TV SYSTEMS, CLOSED CIRCUIT

CABLE, ARMORED  
 CABLE, ASSEMBLIES  
 CABLE, CATV, HARDWARE  
 CABLE, COAXIAL, FLEXIBLE  
 CABLE, COAXIAL, RIGID  
 CABLE, DIRECT-BURIAL  
 CABLE, SHIELDED, AUDIO  
 CHARGERS, BATTERY  
 COMMUNICATIONS SYSTEMS, CB  
 CONNECTORS, AF & MICROPHONE  
 CONNECTORS, ANTENNA  
 CONNECTORS, COAXIAL CABLE  
 CONNECTORS, POWER  
 CONNECTORS, RF  
 DIALS, INSTRUMENT  
 GENERATORS, SIGNAL, COLOR BAR  
 GENERATORS, SIGNAL, RF  
 METERS, FIELD STRENGTH  
 PLUGS, COAXIAL  
 PLUGS, PHONE  
 POTENTIOMETERS, CARBON  
 POTENTIOMETERS, WIREWOUND  
 RESISTORS, FIXED, PRECISION  
 RESISTORS, FIXED, WIREWOUND  
 RESISTORS, VARIABLE, CARBON  
 RESISTORS, VARIABLE,  
 WIREWOUND

**AMPLIFIER CORP. OF AMERICA**

AMPLIFIER, AF, AGC  
 AMPLIFIER, AF, COMPRESSING  
 AMPLIFIER, AF,  
 GENERAL PURPOSE  
 AMPLIFIER, AF, REVERBERATION  
 DEMAGNETIZERS, BULK TAPE  
 DEMAGNETIZERS, HEAD  
 METERS, FLUTTER & WOW  
 PROJECTORS, SLIDE  
 RECORDERS, MAGNETIC TAPE,  
 AUDIO  
 REVERBERATION DEVICES

**AMPLIVISION CORPORATION**

AMPLIFIER, BRIDGING  
 AMPLIFIER, CATV  
 AMPLIFIER, DISTRIBUTION  
 AMPLIFIER, RF,  
 GENERAL PURPOSE  
 AMPLIFIER, TV, BOOSTER  
 AMPLIFIER, TV, VIDEO  
 AMPLIFIER, VIDEO, SWEET  
 ANTENNAS, TV,  
 MASTER-COMMUNITY  
 CABLE, CATV, HARDWARE  
 CAMERA, REMOTE  
 CONTROL EQUIPMENT  
 CAMERAS, TV, COLOR  
 CAMERAS, TV, MONOCHROME  
 CATV EQUIPMENT - ALSO SEE  
 OTHER CATEGORIES  
 CATV, CHANNEL AMPLIFIERS  
 CATV, HEAD-END EQUIPMENT  
 CATV, ORIGINATION EQUIPMENT  
 COMMUNICATIONS SYSTEMS,  
 MICROWAVE  
 CONNECTORS, ANTENNA  
 CONNECTORS, COAXIAL CABLE  
 CONNECTORS, RF  
 CONSOLE, VIDEO, PORTABLE  
 CONSOLE, VIDEO, STUDIO  
 CONVERTERS  
 GENERATORS, FM, SUBCARRIER  
 HEAD-END EQUIPMENT,  
 SEE CATV HEAD-END EQUIPMENT  
 MONITORS, VIDEO  
 NARROW-BAND FM EQUIPMENT  
 NETWORKS, MATCHING, RF  
 NETWORKS, PHASING  
 RECORDERS, MAGNETIC TAPE,  
 VIDEO  
 RODS, GROUND  
 TAPE DECKS, MAGNETIC  
 TAPE, MAGNETIC RECORDING,  
 VIDEO  
 TOWERS, ANTENNA,  
 CATV, HEAD-END  
 TRANSLATOR SYSTEMS  
 TV SYSTEMS, CLOSED CIRCUIT

**ANACONDA ASTRODATA CO.**

AMPLIFIER, BRIDGING  
 AMPLIFIER, CATV  
 AMPLIFIER, DISTRIBUTION  
 AMPLIFIER, TV, BOOSTER  
 CABLE, CATV, HARDWARE  
 CABLE, COAXIAL, FLEXIBLE  
 CABLE, DIRECT-BURIAL  
 CATV EQUIPMENT - ALSO SEE  
 OTHER CATEGORIES  
 CATV, CABLE TERMINALS  
 CATV, CHANNEL AMPLIFIERS  
 CATV, HEAD-END EQUIPMENT  
 CONNECTORS, COAXIAL CABLE  
 HEAD-END EQUIPMENT,  
 SEE CATV HEAD-END EQUIPMENT  
 INDUSTRIAL TV  
 METERS, FIELD STRENGTH  
 POWER SUPPLIES, AC  
 TRANSFORMERS, GENERAL  
 TV SYSTEMS, CLOSED CIRCUIT

**ANCHA ELECTRONICS**

CONSOLE, AUDIO, FM  
 CONSOLE, AUDIO, RECORDING  
 CONSOLE, AUDIO, TV  
 CONSOLE, AUDIO, AM

**KEITH ANDERSON CO.**

AMPLIFIER, CATV  
 AMPLIFIER, RF,  
 GENERAL PURPOSE  
 AMPLIFIER, RF, POWER  
 BALUNS  
 CATV, CHANNEL AMPLIFIERS  
 CATV, HEAD-END EQUIPMENT  
 CONVERTERS

GENERATORS, POWER,  
WIND AND THERMOELECTRIC  
TRANSLATOR SYSTEMS  
TRANSMITTERS, TV, 1 WATT  
TRANSMITTERS, TV, 10 WATTS

**ANDREW CORPORATION**

ANTENNAS, MICROWAVE  
ANTENNAS, MOBILE  
ANTENNAS, 2500 MHZ  
CABLE, ASSEMBLIES  
CABLE, CATV, HARDWARE  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
CABLE, DIRECT-BURIAL  
CLAMPS, CABLE  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, RF  
DELAY LINES  
JOINTS, ROTARY, COAXIAL  
JOINTS, ROTARY, WAVEGUIDE  
MICROWAVE COMPONENTS  
MOBILE EQUIPMENT  
MOUNTS, ANTENNA, FIXED  
PRESSURIZATION EQUIPMENT,  
TRANSMISSION LINE  
RADOMES  
REMOTE CONTROL SYSTEMS  
STL EQUIPMENT  
SWITCHES, COAXIAL  
SWITCHES, WAVEGUIDE  
SWITCHING MATRICES  
SWITCHING SYSTEMS  
TRANSMISSION LINES  
WAVEGUIDE AND  
ASSOCIATED COMPONENTS

**ANSONIA WIRE AND CABLE CO.**

CABLE, COAXIAL, FLEXIBLE  
CABLE, TELEPHONE

**ANTENNA PRODUCTS COMPANY**

ANTENNAS, AM  
ANTENNAS, CATV  
ANTENNAS, FM  
ANTENNAS, TV,  
MASTER-COMMUNITY  
BALUNS  
CABLE, COAXIAL, RIGID  
INSULATORS, ANTENNA  
INSULATORS, STAND-OFF  
TOWERS, ANTENNA,  
CATV HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV  
TRANSFORMERS, RF  
TRANSMISSION LINES

**API INSTRUMENTS CO.**

AMMETERS, AC  
AMMETERS, AC, THERMOCOUPLE  
AMMETERS, DC  
METERS, DB AND VU  
METERS - SEE SPECIFIC TYPES  
RECORDERS, PAPER,  
LOGGING AND GRAPHIC  
RELAYS, OVERLOAD  
VOLTMETERS, AC  
VOLTMETERS, DC

**APPARATUS DEVELOPMENT CO.**

ANTENNAS, FM  
BALUNS

**APPLIED ELECTRO-MECHANICS**

ADAPTERS, CONNECTOR  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, SENSING  
AMPLIFIER, TV, VIDEO  
CORDS, PATCH  
GENERATORS, SIGNAL,  
SPECIAL EFFECT  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, PORTABLE  
WIRING AND CABLING SERVICES

**ARRIFLEX CORP. OF AMERICA**

CAMERAS, FILM, CINE  
PROJECTORS, FILM

**ASCO SONOCRAFT CORP.**

AMPLIFIER, DISTRIBUTION  
BACKGROUND MUSIC SERVICE  
BROADCAST PROGRAMMING SERVICE  
CAMERAS, TV, COLOR  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRELESS  
CONSOLE, AUDIO, RECORDING  
CONSOLE, CABINETS  
AND HARDWARE  
EARPHONES, HEADPHONES  
EDITORS, AUDIO TAPE  
EDUCATION FACILITIES, EQPT  
ENCLOSURES, SPEAKER  
MAINTENANCE SERVICES, AM  
MAINTENANCE SERVICES, FM  
RECORDS, BLANK, ACETATE,  
FOR RECORDING  
SCREENS, PROJECTION, FRONT  
TAPE DECKS, MAGNETIC  
TAPE DUPLICATORS  
TAPE, MAGNETIC RECORDING,  
AUDIO  
TAPE, MAGNETIC RECORDING,  
VIDEO

**THE ASTATIC CORPORATION**

ARMS, TONE

CARTRIDGES, PHONO  
EARPHONES, HEADPHONES  
MICROPHONE STANDS & BOOMS  
MICROPHONES, DYNAMIC  
STYLUS, CUTTING  
STYLUS, PLAYBACK  
TAPE, MAGNETIC RECORDING,  
AUDIO

**ATLAS SOUND**

ACOUSTIC MATERIALS  
ADAPTERS, CONNECTOR  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
LAMP ASSEMBLIES  
MOBILE EQUIPMENT  
MOUNTS, INSTRUMENT  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, THEATER  
SPEAKER COMPONENTS  
SPEAKERS  
SWITCHES, FOOT  
TRANSFORMERS, AUDIO, MATCHING

**AUDIO ACCESSORIES**

CORDS, PATCH  
JACK PANEL ASSEMBLIES  
JACKS  
LAMPS, PANEL  
PLUGS, PHONE  
SOCKETS, LAMP  
WIRING AND CABLING SERVICES

**AUDIO DEVICES**

CARTRIDGES, MAGNETIC TAPE  
DEMAGNETIZERS, HEAD  
HEADS, DISC RECORDING  
RECORDS, BLANK, LACQUER,  
FOR RECORDING  
REELS, TAPE  
TAPE, MAGNETIC RECORDING,  
AUDIO  
TAPE, MAGNETIC RECORDING,  
AUDIO, CARTRIDGE  
TAPE, MAGNETIC RECORDING,  
COMPUTER  
TAPE, MAGNETIC RECORDING,  
TEST

**AUDIO INSTRUMENT CO.**

AMPLIFIER, AF, REVERBERATION  
ANALYZERS, DISTORTION  
ANALYZERS, INTERMODULATION  
DELAY DEVICES, AF  
DELAY LINES  
EDUCATION FACILITIES, EQPT  
PREAMPLIFIERS, AUDIO  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, THEATER  
TAPE DECKS, MAGNETIC  
TELEPHONE EQUIPMENT

**BALL BROTHERS RESEARCH**

AMPLIFIER, CATV  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, STABILIZING  
AMPLIFIER, TV, VIDEO  
CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
GENERATORS, SIGNAL,  
SPECIAL EFFECT  
INDUSTRIAL TV  
TV SYSTEMS, CLOSED CIRCUIT

**BARKER & WILLIAMSON**

ANALYZERS, DISTORTION  
ANALYZERS, HARMONIC  
COLLS, ANTENNA LOADING  
COLLS, CHOKER, RF  
DUMMY LOAD  
GENERATORS, SIGNAL, AF  
SWITCHES, COAXIAL  
TRANSFORMERS, RF

**BAUER ELECTRONICS CORPORATION**

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
AMPLIFIER, AF, REVERBERATION  
AMPLIFIER, AF, STEREO  
AMPLIFIER, BRIDGING  
AMPLIFIER, DC  
AMPLIFIER, RF, POWER  
CARRIER-CURRENT EQUIPMENT  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, CABINETS  
AND HARDWARE  
CONSOLE, KITS  
DELAY DEVICES, AF  
MIXERS - ALSO SEE CONSOLES  
PREAMPLIFIERS, AUDIO  
RECORDERS, PAPER,  
LOGGING AND GRAPHIC  
REMOTE CONTROL SYSTEMS  
REVERBERATION DEVICES  
TRANSMITTER KITS  
TRANSMITTERS, AM, LOW POWER  
TRANSMITTERS, AM, 250 WATT  
TRANSMITTERS, AM, 1 KW  
TRANSMITTERS, AM, 5 KW  
TRANSMITTERS, AM, 10 KW

## Color Problems?

# AEM HAS THREE NEW ANSWERS



**LAP AMPLIFIERS**—Here's the new LDA-series of lap-dissolve amplifiers that AEM developed especially for color. Photo-electric cells, remotely controlled by DC circuitry, assure a velvety transition between two inputs. All solid state (silicon semiconductors exclusively), the LDA provides the signal handling characteristics of a high performance distribution amplifier. Differential phase and gain do not change even during the lap interval. Embarrassing color shifts and level changes become a thing of the past. And the price is just as attractive as the performance: LDA-1, \$555.00; LDA-2 (sync adding), \$585.00.

**COLOR SENSORS**—We are introducing a Color Sensor attachment to the LDA amplifiers which samples both incoming channels and then closes a relay when *either* input has color burst . . . gives your switching system the information it needs to react properly. LDA-1 with Color Sensor, \$595.00; LDA-2 with Color Sensor, \$625.00.

**BURST GENERATOR**—Our new black Burst Generator with CONTROLLED chroma background will allow you to control color fades to black or any hue. The variable chroma feature also acts as a source for coloring backgrounds of monochrome slides and movies. Color Burst Generator, just \$595.00; standard black Burst Generator, \$545.00.

Call or write for more information about AEM video equipment. Feature for feature, there is nothing comparable on today's market!

## APPLIED ELECTRO MECHANICS, INC.

2350 Duke Street, Alexandria, Virginia 22314  
PHONE: (703) 548-2166



TRANSMITTERS, AM, 25 KW  
TRANSMITTERS, AM, 50 KW  
TRANSMITTERS, FM, 1 KW  
TRANSMITTERS, FM, 3 KW  
TRANSMITTERS, FM, 7.5 KW  
TRANSMITTERS, FM, 10 KW  
TRANSMITTERS, FM, 20 KW

**E. J. BAUGHMAN CO.**

CAMERA, MOUNTING EQUIPMENT  
MICROPHONE STANDS & BOOMS

**BECKMAN & WHITLEY**

CAMERAS, FILM, CINE  
WEATHER INSTRUMENTS

**BELAR ELECTRONICS LABORATORY**

AMPLIFIER, RF, PEAK LIMITING  
COMMUNICATIONS SYSTEMS,  
MULTIPLY  
DEMODULATORS  
EXCITERS, FM  
GENERATORS, FM, STEREO  
METERS, FREQUENCY  
MONITORS, AM SYSTEMS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, SCA  
MONITORS, FM SYSTEMS, STEREO  
MONITORS, FREQUENCY  
OSCILLATORS, FM  
RECEIVERS, FM  
RECEIVERS, MULTIPLEX  
RECEIVERS, SCA

**BELDEN MANUFACTURING CO.**

CABLE, COAXIAL, FLEXIBLE  
CABLE, DIRECT-BURIAL  
CABLE, SHIELDED, AUDIO  
CABLE, TELEPHONE  
CORDS, SET  
WIRE, BARE, COPPER  
WIRE, INSULATED, HIGH VOLTAGE  
WIRE, INSULATED, HOOKUP  
WIRE, SHIELDED

**F. W. BELL, INC.**

CONVERTERS  
GAUSS METER  
MONITORS, POWER  
PROBES, TEST LEAD  
WATTMETERS

**BENCO TELEVISION ASSOCIATES**

AMPLIFIER, CATV  
AMPLIFIER, TV, BOOSTER  
ANTENNAS, TV,  
MASTER-COMMUNITY  
ATTENUATORS, RF  
CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
CATV, CABLE TERMINALS  
CATV, CHANNEL AMPLIFIERS  
CATV, HEAD-END EQUIPMENT  
CONNECTORS, COAXIAL CABLE  
CONVERTERS  
FILTERS, ANTENNA  
HEAD-END EQUIPMENT,  
SEE CATV HEAD-END EQUIPMENT  
HOUSINGS, ANTENNA  
METERS, FIELD STRENGTH  
TRANSLATOR SYSTEMS

**BENJAMIN ELECTRONIC SOUND CORP**

CARTRIDGES, PHONO  
RECEIVERS, AM  
RECEIVERS, FM  
RECEIVERS, HF  
TURNTABLES, PHONOGRAPH

**BENRUS TECHNICAL PRODUCTS**

CAMERAS, OSCILLOSCOPE  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
OSCILLOSCOPES  
VOLTMETERS, TRANSISTORIZED

**BERKEY TECHNICAL CORP.**

BATTERIES, NICKEL CADMIUM  
CAMERA, MOUNTING EQUIPMENT  
STROBE, LIGHTS

**BIONIC INSTRUMENTS, INC.**

ALARM, FAULT  
ALARM, INTRUDER  
ALARM, SIGNAL  
INDUSTRIAL TV  
REMOTE CONTROL SYSTEMS  
TAPE DUPLICATORS  
TIMERS, ELECTRIC  
TV SYSTEMS, CLOSED CIRCUIT

**BIRD ELECTRONIC CORPORATION**

ALARM, FAULT  
ATTENUATORS, FIXED  
ATTENUATORS, RF  
CALORIMETERS  
CONNECTORS, RF  
COUPLERS  
DETECTORS, STANDING WAVE  
DUMMY LOAD  
FILTERS, ANTENNA  
FILTERS, RF  
METERS, POWER  
METERS, STANDING WAVE  
MICROWAVE COMPONENTS  
MONITORS, POWER  
SWITCHES, COAXIAL  
WATTMETERS

**BIRNBACH CO.**

ADAPTERS, TEST  
ANCHORS, GUY  
CABLE, ARMORED  
CABLE, DIRECT-BURIAL  
CABLE, SHIELDED, AUDIO  
CABLE, TELEPHONE

CLAMPS, CABLE  
CLIPS, TEST  
CORDS, DIAL  
CORDS, LACING  
CORDS, PATCH  
CORDS, SET  
HARDWARE, GENERAL  
HARDWARE, GROMMETS  
HARDWARE, RACK  
HARDWARE, TUBING, PLASTIC  
HEAT SINKS  
INSULATORS, ANTENNA  
INSULATORS, FEED THROUGH  
INSULATORS, STAND-OFF  
INSULATORS, OTHER  
JACKS  
KNOBS  
LIGHTNING ARRESTERS  
PLUGS, PHONE  
SWITCHES, KNIFE  
SWITCHES, PUSHBUTTON,  
NONILLUMINATED  
SWITCHES, SLIDE  
SWITCHES, TOGGLE  
TERMINAL STRIPS  
TERMINALS, LUG  
TERMINALS, SOLDER  
TERMINALS, SOLDERLESS  
WIRE, BARE, COPPER  
WIRE, INSULATED, HIGH VOLTAGE  
WIRE, INSULATED, HOOKUP  
WIRE, SHIELDED

**BIRNS & SAWYER**

ADAPTERS, CONNECTOR  
AMPLIFIER, DC  
BATTERIES, NICKEL CADMIUM  
CAMERA, MOUNTING EQUIPMENT  
CAMERAS, FILM, CINE  
CAMERAS, FILM, STILL  
CHARGERS, BATTERY  
CONVERTERS  
DOLLIES, CAMERA  
EDITORS, AUDIO TAPE  
EDITORS, FILM  
EDITORS, VIDEO TAPE  
INVERTERS, DC TO AC,  
VIBRATORS  
LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
LIGHTING, TV, COMPONENTS  
MIXERS - ALSO SEE CONSOLES  
MOUNTS, INSTRUMENT  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC  
PROJECTORS, FILM  
REELS, FILM  
REELS, TAPE  
SCREENS, PROJECTION, FRONT  
SPLICERS, MAGNETIC TAPE  
AND FILM  
TAPE, MAGNETIC RECORDING,  
AUDIO

**BISCAYNE AUDIO COMPANY**

BROADCAST PROGRAMMING SERVICE

**BLAW-KNOX COMPANY**

TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

**BLONDER-TONGUE LABORATORIES**

ADAPTERS, CONNECTOR  
AMPLIFIER, CATV  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, TV, BOOSTER  
AMPLIFIER, TV, VIDEO  
AMPLIFIER, VIDEO, SWEEP  
ANTENNAS, CATV  
ANTENNAS, FM  
ANTENNAS, TV  
ANTENNAS, TV,  
MASTER-COMMUNITY  
ATTENUATORS, RF  
BALUNS  
BRIDGES  
CAMERAS, FILM, CINE  
CAMERAS, FILM, STILL  
CAMERAS, TV, COLOR  
CAMERAS, TV, MONOCHROME  
CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
CATV, CHANNEL AMPLIFIERS  
CATV, HEAD-END EQUIPMENT  
CATV, ORIENTATION EQUIPMENT  
CONNECTORS, ANTENNA  
CONNECTORS, COAXIAL CABLE  
CONSOLE, AUDIO, TV  
CONVERTERS  
DETECTORS, STANDING WAVE  
DIPLEXERS  
DISPLAY EQUIPMENT, TV  
DOLLIES, CAMERA  
FILTERS, ANTENNA  
FILTERS, RF  
GENERATORS, SIGNAL, MARKER  
GENERATORS, SIGNAL, RF  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
HEAD-END EQUIPMENT,  
SEE CATV HEAD-END EQUIPMENT  
INDUSTRIAL TV  
METERS, FIELD STRENGTH  
METERS, FREQUENCY  
MIXERS - ALSO SEE CONSOLES  
MODULATORS, TV  
MONITORS, VIDEO  
POWER SUPPLIES, AC

POWER SUPPLIES, DC  
PREAMPLIFIERS, VIDEO  
RELAYS, THERMAL  
SWITCHES  
SWITCHES, COAXIAL  
TOOLS, CRIMPERS  
TRANSFORMERS, RF  
TV SYSTEMS, CLOSED CIRCUIT  
WEATHER INSTRUMENTS

**BOSTON INSULATED WIRE & CABLE**

CABLE, ARMORED  
CABLE, ASSEMBLIES  
CABLE, CAMERA  
CABLE, COAXIAL, FLEXIBLE  
CABLE, SHIELDED, AUDIO  
WIRE, INSULATED, HIGH VOLTAGE  
WIRE, SHIELDED  
WIRING AND CABLING SERVICES

**W. M. BRADY CO.**

DECALCOMANIAS  
LETTERS AND NUMBERS,  
PRESSURE SENSITIVE

**BROADCAST ELECTRONICS, INC.**

AMPLIFIER, DISTRIBUTION  
AUTOMATION EQUIPMENT  
CABINETS, STORAGE,  
MAGNETIC TAPE  
CABINETS, STORAGE,  
MAGNETIC TAPE, CARTRIDGE  
CARTRIDGES, MAGNETIC TAPE  
CLEANERS, CHEMICAL  
DEMAGNETIZERS, BULK TAPE  
DEMAGNETIZERS, HEAD  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
AUDIO, CARTRIDGE  
REELS, TAPE  
SPLICERS, MAGNETIC TAPE  
AND FILM  
TAPE DECKS, MAGNETIC  
TAPE, MAGNETIC RECORDING,  
AUDIO  
TAPE, MAGNETIC RECORDING  
AUDIO, CARTRIDGE  
TELEPHONE EQUIPMENT  
WINDERS, CARTRIDGE

**BROADCAST PRODUCTS COMPANY**

AMPLIFIER, SENSING  
AUTOMATION EQUIPMENT  
CABINETS, STORAGE,  
MAGNETIC TAPE, CARTRIDGE  
CABINETS, WOOD

**BROWNING LABORATORIES**

AMPLIFIER, AF, MONAURAL  
ANTENNAS, FM  
BACKGROUND MUSIC SERVICE  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS,  
MULTIPLEX, FM  
MONITORS, FM SYSTEMS, MONO  
RECEIVERS, MULTIPLEX  
RECEIVERS, SCA

**BUCHANAN ELECTRICAL PROD CORP**

INSULATORS, OTHER  
TERMINAL BLOCKS  
TERMINAL BOARDS  
TERMINAL CARDS  
TERMINAL STRIPS  
TERMINALS, BARRIER  
TERMINALS, LUG  
TERMINALS, SOLDER  
TERMINALS, SOLDERLESS  
TOOLS, CRIMPERS

**BUD RADIO, INC**

BLOWERS AND FANS  
CABINETS, METAL  
CAPACITORS, FIXED, GENERAL  
CAPACITORS, VARIABLE  
CONSOLE, CABINETS  
AND HARDWARE  
HARDWARE, CHASSIS  
HARDWARE, FIXTURES, HOLDING  
HARDWARE, LOUVERS,  
VENTILATING  
HARDWARE, MOUNTS  
HARDWARE, PANEL  
HARDWARE, RACK  
PANELS, INSTRUMENT,  
FOR RACK MOUNTING  
RACKS, MOUNTING  
SLIDES, CHASSIS

**BURGESS BATTERY COMPANY**

BATTERIES, DRY CELL  
TAPE, MAGNETIC RECORDING,  
AUDIO

**BURKE & JAMES**

CABINETS, METAL  
CABINETS, STORAGE,  
MAGNETIC TAPE  
CABINETS, WOOD  
CAMERA, MOUNTING EQUIPMENT  
CAMERAS, FILM, CINE  
CAMERAS, FILM, STILL  
DUCTS, VENTILATION  
EDITORS, FILM  
FILTERS, OTHER  
LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
LIGHTING, TV, COMPONENTS  
METERS, LIGHT  
PROCESSORS, FILM, B-W  
PROCESSORS, FILM, COLOR  
PROJECTORS, FILM  
PROJECTORS, SLIDE

REELS, FILM  
REWINDERS, FILM  
SCREENS, PROJECTION, FRONT  
SCREENS, PROJECTION, REAR  
SPLICERS, MAGNETIC TAPE  
AND FILM  
TIMERS, ELECTRIC

**CALBEST ELECTRONICS**

ADAPTERS, FM STEREO  
AMPLIFIER, AF, STEREO  
COILS, CHOKE, RF  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRE  
RECEIVERS, AM  
RECEIVERS, FM  
RECEIVERS, SCA  
SPEAKER COMPONENTS

**CALIFONE-ROBERTS**

AMPLIFIER, AF, REVERBERATION  
MICROPHONES, DYNAMIC  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
SOUND SYSTEMS, PORTABLE  
SPEAKERS

**CALVERT ELECTRONICS**

VACUUM TUBES, RECEIVING  
VACUUM TUBES, TRANSMITTING

**CARDWELL CONDENSER CORP**

CAPACITORS, VARIABLE  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, OTHER  
WAVEGUIDE AND  
ASSOCIATED COMPONENTS

**CATEL COMPANY**

AMPLIFIER, TV, VIDEO  
CATV, ORIENTATION EQUIPMENT  
GENERATORS, FM, STEREO  
MODULATORS, TV  
TRANSLATOR SYSTEMS, FM

**CBS LABORATORIES**

AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
AMPLIFIER, MASKING  
DISPLAY EQUIPMENT, TV  
ENHANCERS, TV IMAGE  
METERS, DB AND VU  
METERS, DB AND VU, WIDE RANGE  
RECORDS, TEST

**CCA ELECTRONICS CORPORATION**

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, RF, PEAK LIMITING  
AMPLIFIER, RF, POWER  
ANTENNAS, AM  
ANTENNAS, FM  
AUTOMATION EQUIPMENT  
BACKGROUND MUSIC SERVICE  
CABINETS, METAL  
CIRCUIT BREAKERS  
CLOCKS  
COILS, ANTENNA LOADING  
COILS, CHOKE, RF  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CORDS, PATCH  
DUMMY LOAD  
EQUALIZERS, AUDIO EMPHASIS  
EXCITERS, FM  
FILTERS, ANTENNA  
FILTERS, RF  
GENERATORS, FM, STEREO  
GENERATORS, FM, SUBCARRIER  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, RF  
HOUSINGS, ANTENNA  
INDUCTANCES, FIXED  
INDUCTANCES, VARIABLE  
MAINTENANCE SERVICES, AM  
MAINTENANCE SERVICES, FM  
METERS, POWER  
MONITORS, AM SYSTEMS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, SCA  
MONITORS, FM SYSTEMS, STEREO  
MONITORS, FREQUENCY  
NETWORKS, MATCHING, RF  
NETWORKS, PHASING  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
OSCILLATORS, AM  
OSCILLATORS, FM  
PREAMPLIFIERS, AUDIO  
RECEIVERS, AM  
RECEIVERS, FM  
RECEIVERS, MULTIPLEX  
RECEIVERS, SCA  
RECTIFIERS - ALSO SEE SEMI-  
CONDUCTORS & VACUUM TUBES  
REGULATORS, VOLTAGE  
SPEAKERS

STL EQUIPMENT  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TRANSMITTER KITS  
TRANSMITTERS, AM, 250 WATT  
TRANSMITTERS, AM, 1 KW  
TRANSMITTERS, AM, 5 KW  
TRANSMITTERS, AM, 10 KW  
TRANSMITTERS, AM, 25 KW  
TRANSMITTERS, AM, 50 KW  
TRANSMITTERS, AM, OVER 50 KW  
TRANSMITTERS, FM, 10 WATTS  
TRANSMITTERS, FM, 100 WATTS  
TRANSMITTERS, FM, 250 WATTS  
TRANSMITTERS, FM, 1 KW  
TRANSMITTERS, FM, 3 KW  
TRANSMITTERS, FM, 5 KW  
TRANSMITTERS, FM, 10 KW  
TRANSMITTERS, FM, 15 KW  
TRANSMITTERS, FM, 20 KW  
TRANSMITTERS, FM, 40 KW  
VACUUM TUBES, TRANSMITTING  
WIRE, BARE, COPPER  
WIRE, BARE, COPPER STRAP

**C-COR ELECTRONICS**

AMPLIFIER, BRIDGING  
AMPLIFIER, CATV  
AMPLIFIER, DC  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, RF, POWER  
AMPLIFIER, TV, BOOSTER  
AMPLIFIER, TV, VIDEO  
CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
CATV, CHANNEL AMPLIFIERS  
CATV, HEAD-END EQUIPMENT  
HEAD-END EQUIPMENT  
SEE CATV HEAD-END EQUIPMENT

**CENTRALAB**

ATTENUATORS, AUDIO  
CAPACITORS, FIXED, CERAMIC  
CAPACITORS, FIXED, METALLIZED  
CAPACITORS, VARIABLE  
INSULATORS, ANTENNA  
INSULATORS, FEED THROUGH  
INSULATORS, STAND-OFF  
INSULATORS, OTHER  
INTEGRATED CIRCUITS  
POTENTIOMETERS, CARBON  
POTENTIOMETERS, WIREWOUND  
SWITCHES, LEVER  
SWITCHES, MULTICONTACT  
SWITCHES, PUSHBUTTON,  
NONILLUMINATED  
SWITCHES, ROTARY  
SWITCHES, SLIDE

**CENTRAL DYNAMICS CORP.**

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, FM,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, STEREO  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, STABILIZING  
AMPLIFIER, TV, VIDEO  
ATTENUATORS, VIDEO  
AUTOMATION EQUIPMENT  
CATV, ORIGINATION EQUIPMENT  
CLOCKS  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
CONSOLE, AUDIO, TV  
CONSOLE, VIDEO, PORTABLE  
CONSOLE, VIDEO, STUDIO  
CORDS, PATCH  
DELAY LINES  
DISPLAY EQUIPMENT, TV  
EDUCATION FACILITIES, EOPT  
GENERATORS, SIGNAL,  
SPECIAL EFFECT  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
GENERATORS, SIGNAL, VITS  
INDUSTRIAL TV  
JACK PANEL ASSEMBLIES  
JACKS  
MAINTENANCE SERVICES, TV  
MIXERS - ALSO SEE CONSOLES  
MOBILE EQUIPMENT  
PREAMPLIFIERS, AUDIO  
PREAMPLIFIERS, VIDEO  
REMOTE CONTROL SYSTEMS  
SWITCHERS  
SWITCHES, CROSSBAR  
SWITCHING MATRIXES  
SWITCHING SYSTEMS  
TV SYSTEMS, CLOSED CIRCUIT

**CENTURY LIGHTING INC.**

LIGHTING, TV, COMPONENTS  
LIGHTING, TV, CONTROLS  
LIGHTING, TV, SYSTEMS  
MICROPHONE STANDS & BOOMS

**CENTURY PROJECTOR CORPORATION**

AMPLIFIER, AF,  
GENERAL PURPOSE  
POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO  
PROJECTORS, FILM  
RACKS, MOUNTING  
RECORDERS, FILM, MAGRETI  
REWINDERS, FILM  
SEMICONDUCTOR RECTIFIERS,  
GENERAL

SOUND SYSTEMS, PORTABLE  
SOUND SYSTEMS, THEATER  
SPEAKERS

**CHASSIS TRAK  
SLIDES, CHASSIS**

**CHRONO-LOG CORPORATION**

AUTOMATION EQUIPMENT  
CLOCKS  
COMPUTER EQUIPMENT

**CINE SONIC SOUND**

BACKGROUND MUSIC SERVICE  
CARTRIDGES, MAGNETIC TAPE  
CARTRIDGES, TAPE,  
RECORDING SERVICE

**CLEVELAND ELECTRONICS**

COILS, DEFLECTION  
AND FOCUSING

**CLEVELAND ELECTRONICS**

SPEAKER DIVISION  
REVERBERATION DEVICES  
SPEAKERS

**COMU ELECTRONICS**

AMMETERS, DC  
AMPLIFIER, DC  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, TV, VIDEO  
CABLE, ASSEMBLIES  
CAMERA, MOUNTING EQUIPMENT  
CAMERA, REMOTE  
CONTROL EQUIPMENT  
CAMERAS, TV, COLOR  
CAMERAS, TV, MONOCHROME  
CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
CATV, ORIGINATION EQUIPMENT  
DISPLAY EQUIPMENT, TV  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
INDUSTRIAL TV  
LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
METERS - SEE SPECIFIC TYPES  
MONITORS, VIDEO  
OHMMETERS  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC  
POWER SUPPLIES, PRECISION  
SWITCHES  
SWITCHING MATRIXES  
SWITCHING SYSTEMS  
TV SYSTEMS, CLOSED CIRCUIT  
VOLTMETERS, AC  
VOLTMETERS, DC  
VOLTMETERS, VACUUM TUBE

**COLLINS RADIO COMPANY**

AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
ANTENNAS, FM  
COILS, ANTENNA LOADING  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, TV  
EXCITERS, FM  
MICROWAVE SYSTEMS, STL  
MONITORS, AM SYSTEMS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, SCA  
MONITORS, FM SYSTEMS, STEREO  
MONITORS, FREQUENCY  
NETWORKS, PHASING  
RECORDERS, MAGNETIC TAPE,  
AUDIO, CARTRIDGE  
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TRANSMITTERS, AM, 1 KW  
TRANSMITTERS, AM, 5 KW  
TRANSMITTERS, AM, 10 KW  
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CABINETS, STORAGE, MAGNETIC TAPE  
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FILTERS, OTHER  
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RELAYS, OVERLOAD  
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CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
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CONSOLE, KITS  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, VIDEO, PORTABLE  
CONSOLE, VIDEO, STUDIO  
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PROBES, OSCILLOSCOPE  
RACKS, MOUNTING  
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CORDS, PATCH  
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HARDWARE, CHASSIS  
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MANIFOLDS  
POWER SUPPLIES, AC  
TERMINAL BOARDS  
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RECEIVERS, FM  
SEMICONDUCTOR RECTIFIERS  
SILICON CONTROLLED - SCR  
SEMICONDUCTORS,  
TRANSISTORS, AF  
SEMICONDUCTORS, TRANSISTORS, GENERAL

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ALARM, SIGNAL  
AMPLIFIER, AF, GENERAL PURPOSE  
AMPLIFIER, BRIDGING  
AMPLIFIER, DISTRIBUTION  
AUTOMATION EQUIPMENT  
CAMERA, REMOTE CONTROL EQUIPMENT  
COMMUNICATIONS SYSTEMS, INTERCOM, WIRED  
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EDUCATION FACILITIES, EQPT  
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POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO  
REMOTE CONTROL SYSTEMS  
TESTERS, SEMICONDUCTOR

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DETECTORS, STANDING WAVE  
DIVIDERS, FREQUENCY  
DIVIDERS, POWER  
DUMMY LOAD  
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METERS, STANDING WAVE  
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TRANSMITTERS, FM, TO ORDER  
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PROBES, OSCILLOSCOPE  
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SOCKETS, LAMP  
SOCKETS, TUBE  
SPEAKER COMPONENTS  
SWITCHES, SLIDE  
SWITCHES, SNAP  
SWITCHES, TOGGLE  
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TERMINAL BOARDS  
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TERMINALS, BARRIER  
TERMINALS, HIGH VOLTAGE  
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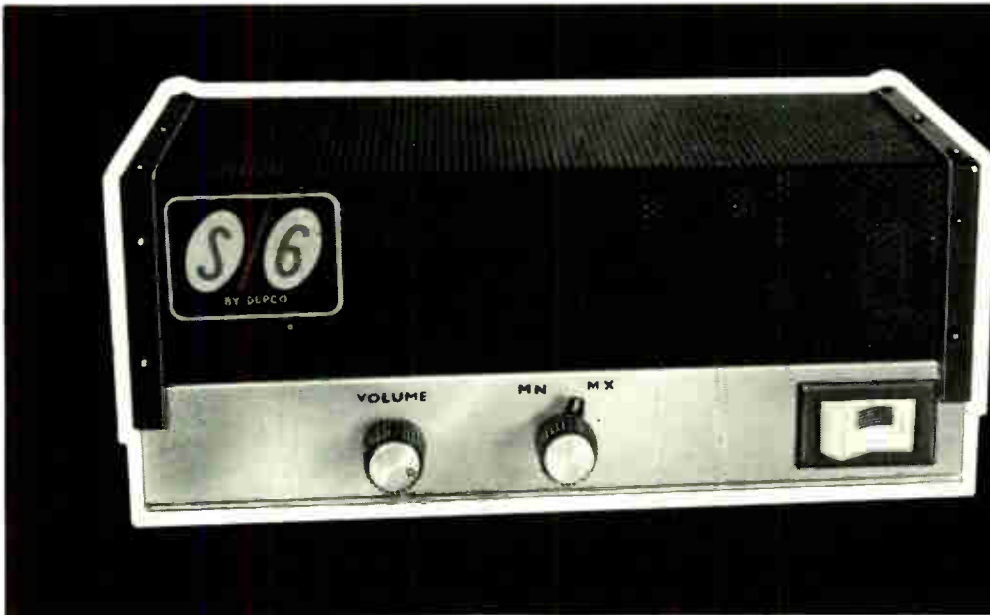
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TRANSFORMERS, AUDIO,  
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TRANSFORMERS, COUPLING  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
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AMPLIFIER, AF,  
PEAK LIMITING, FM  
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CARTRIDGES, PHONO  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, KITS  
HEADS, DISC RECORDING  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
LATHE, DISC RECORDING  
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TELEPRINTER  
MICROWAVE SYSTEMS, STL  
MICROWAVE SYSTEMS, 250D-MHZ  
MICROWAVE SYSTEMS, OTHER  
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FREQUENCY

THE JAMES FLOYD FORD COMPANY  
ALARM, INTRUDER  
ALARM, SIGNAL  
BACKGROUND MUSIC SERVICE  
BROADCAST PROGRAMMING SERVICE  
CALIBRATION SERVICE,  
INSTRUMENT  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRELESS  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
COMPUTER SERVICES  
MAINTENANCE SERVICES, TV  
PROCESSORS, FILM, B-W  
RECORDING SERVICE, AUDIO,  
TAPE  
TELEPHONE EQUIPMENT  
TV SYSTEMS, CLOSED CIRCUIT

FORT WORTH TOWER CO.  
ANTENNAS, MICROWAVE  
PREFABRICATED BUILDINGS  
RADOMES  
REFLECTORS, PASSIVE  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

GAMMA SCIENTIFIC, INC.  
METERS, LIGHT

GATES RADIO COMPANY  
AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, STEREO  
AMPLIFIER, BRIDGING  
AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, RF, POWER  
ANTENNAS, AM  
ANTENNAS, FM  
ANTENNAS, MOBILE  
ANTENNAS, TV  
ARMS, TONE  
AUTOMATION EQUIPMENT  
BASE STATIONS  
CABINETS, METAL  
CABINETS, STORAGE, DISC  
CABINETS, WOOD  
CARTRIDGES, MAGNETIC TAPE  
COILS, ANTENNA LOADING  
COILS, CHOKE, RF  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, CABINETS  
AND HARDWARE  
CONSOLE, AUDIO, AM  
DIVIDERS, POWER  
DUMMY LOAD  
EXCITERS, FM  
FILTERS, ANTENNA  
FILTERS, RF  
FLASHERS, TOWER  
GENERATORS, FM, STEREO  
GENERATORS, FM, SUBCARRIER  
HARDWARE, RACK  
HOUSINGS, ANTENNA  
MICROPHONES, DYNAMIC  
MOBILE EQUIPMENT  
MONITORS, AM SYSTEMS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, SCA  
MONITORS, FM SYSTEMS, STEREO  
MONITORS, FREQUENCY  
MONITORS, PHASE  
MOUNTS, ANTENNA, FIXED  
MOUNTS, ANTENNA, MOBILE  
NETWORKS, MATCHING, AUDIO  
NETWORKS, PHASING  
OSCILLATORS, AM  
OSCILLATORS, FM  
OSCILLATORS, TV  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC  
PREAMPLIFIERS, VIDEO  
PRESSURIZATION EQUIPMENT,  
TRANSMISSION LINE  
RACKS, MOUNTING  
RECEIVERS, FM  
RECORDERS, MAGNETIC TAPE,  
AUDIO, CARTRIDGE  
REMOTE CONTROL SYSTEMS  
SPEAKERS  
SWITCHING SYSTEMS  
TAPE DECKS, MAGNETIC  
TAPE, MAGNETIC RECORDING,  
TEST  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV  
TRANSMISSION LINES  
TRANSMITTER KITS  
TRANSMITTERS, AM, 250 WATT  
TRANSMITTERS, AM, 1 KW  
TRANSMITTERS, AM, 5 KW  
TRANSMITTERS, AM, 10 KW  
TRANSMITTERS, AM, 25 KW  
TRANSMITTERS, AM, 50 KW  
TRANSMITTERS, AM, OVER 50 KW  
TRANSMITTERS, FM, 10 WATTS  
TRANSMITTERS, FM, 50 WATTS  
TRANSMITTERS, FM, 250 WATTS  
TRANSMITTERS, FM, 1 KW  
TRANSMITTERS, FM, 3 KW  
TRANSMITTERS, FM, 5 KW  
TRANSMITTERS, FM, 7.5 KW  
TRANSMITTERS, FM, 10 KW  
TRANSMITTERS, FM, 15 KW  
TRANSMITTERS, FM, 20 KW  
TRANSMITTERS, FM, 40 KW  
TRANSMITTERS, TV, 100 WATTS  
TRANSMITTERS, TV, 500 WATTS  
TRANSMITTERS, TV, 5 KW

GBC AMERICA CORP.  
AMPLIFIER, CATV  
AMPLIFIER, TV, VIDEO  
INDUSTRIAL TV  
MONITORS, VIDEO  
TV SYSTEMS, CLOSED CIRCUIT  
VACUUM TUBES, CAMERA, VIDICON

GBC ELECTRONICS COMPANY  
ADAPTERS, CONNECTOR  
ADAPTERS, FM STEREO  
ADAPTERS, TEST  
ANCHORS, GUY  
ANTENNAS, FM  
ANTENNAS, MOBILE  
ANTENNAS, TV  
CABLE, ASSEMBLIES  
CABLE, SHIELDED, AUDIO  
CHARGERS, BATTERY  
CIRCUIT BREAKERS

CLAMPS, CABLE  
CLEANERS, CHEMICAL  
CLEANERS, OTHER  
CLIPS, TEST  
COILS, DEGAUSSING  
CONNECTORS, AF & MICROPHONE  
CONNECTORS, ANTENNA  
CONNECTORS, COAXIAL CABLE  
CORDS, DIAL  
CORDS, LACING  
COUPLERS  
DECALCOMANIAS  
DEMAGNETIZERS, BULK TAPE  
DEMAGNETIZERS, HEAD  
DESICCANTS  
DIALS, INSTRUMENT  
EARPHONES, HEADPHONES  
ENHANCERS, TV IMAGE  
FUSES  
HARDWARE, CHASSIS  
HARDWARE, DIAL POINTERS  
HARDWARE, GENERAL  
HARDWARE, GROMMETS  
HARDWARE, RACK  
HARDWARE, TOOLS  
HARDWARE, TUBING, PLASTIC  
HEAT SINKS  
HOLDERS, FUSE  
INSULATORS, ANTENNA  
INSULATORS, FEED THROUGH  
INSULATORS, STAND-OFF  
INSULATORS, OTHER  
JACKS  
KNOBS  
LEADS, TEST  
LIGHTNING ARRESTERS  
LUBRICANTS  
MICROPHONE HARDWARE  
MICROPHONE STANDS & BOOMS  
MICROPHONES, DYNAMIC  
MOUNTS, ANTENNA, FIXED  
MOUNTS, ANTENNA, MOBILE  
PLUGS, PHONE  
PROBES, OSCILLOSCOPE  
PROBES, TEST LEAD  
RESISTORS, FIXED, CARBON  
RESISTORS, VARIABLE,  
WIREWOUND  
SOCKETS, TUBE  
SOLDER  
SOLVENTS AND CLEANERS  
SPLICERS, MAGNETIC TAPE  
AND FILM  
STROBE, DISCS  
STROBE, LIGHTS  
SWITCHES, KNIFE  
SWITCHES, PUSHBUTTON,  
NONILLUMINATED  
SWITCHES, ROTARY  
SWITCHES, SLIDE  
SWITCHES, TOGGLE  
TERMINALS, LUG  
TERMINALS, SOLDER  
TERMINALS, SOLDERLESS  
TOOLS, SCREWDRIERS

G E VISUAL COMMUNICATIONS PROD

AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, STEREO  
AMPLIFIER, RF, POWER  
AMPLIFIER, TV, VIDEO  
ANTENNAS, TV  
CABINETS, METAL  
CABLE, SHIELDED, AUDIO  
CAMERAS, TV, COLOR  
CAMERAS, TV, MONOCHROME  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, AUDIO, FM  
DEMODULATORS  
DIPLAXERS  
EQUALIZERS, AUDIO EMPHASIS  
FILTERS, AUDIO  
FILTERS, RF  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
INDUSTRIAL TV  
MONITORS, AM SYSTEMS  
MONITORS, FREQUENCY  
MONITORS, VIDEO  
POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO  
RACKS, MOUNTING  
SWITCHERS  
TRANSMITTERS, TV, 1D KW  
TRANSMITTERS, TV, 30 KW  
TRANSMITTERS, TV, 50 KW  
TRANSMITTERS, TV, 100 KW  
TV SYSTEMS, CLOSED CIRCUIT  
VESTIGIAL SIDEBAND FILTERS

G E DISTRIBUTOR SALES FORCE

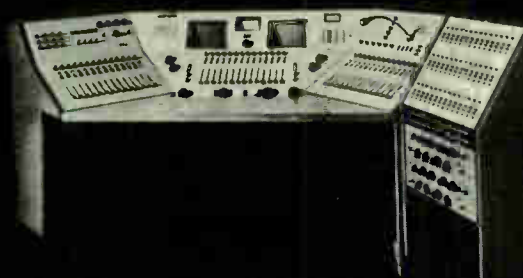
VACUUM TUBES  
CARTRIDGES, PHONO  
CRYSTALS, PIEZOELECTRIC  
LAMPS, GLDW  
LAMPS, EXCITER  
LAMPS, PANEL  
LAMPS, PROJECTION  
SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTOR RECTIFIERS,  
POWER



# SUPER SOUNDS

start  
with

# FAIRCHILD



New FAIRCHILD 42 input TV Network Mixer.



## FAIRCHILD MASTER TAPE IMPROVEMENT SYSTEM

FAIRCHILD MTIS with "focused-gap" head design reduces bias-induced noise to a point where it is no greater than 2 db than the noise of virgin or bulk-erased tape. FAIRCHILD MTIS has an S/N ratio of 72 db on one track of a 4-track 1/2" tape. FAIRCHILD MTIS increases the recording level by 4 db over present standards, with the lowest harmonic, intermodulation, and cross-modulation distortion of only .5%. Only the FAIRCHILD MTIS comes in a compatible, convertible package allowing you to update your present tape transports to the highest quality "state-of-the-art" recording standards.



## FAIRCHILD CONAX

The world-accepted standard to control high frequency spillovers due to pre-emphasis. Maintain high levels even with brass and crashing cymbals in FM and recording.

## THE REVERBERTRON

The new compact reverberation system which gives your station that real big voice. With the Reverbertron you can have that Carnegie Hall effect as close as the gain control on the Reverbertron. And there's the added plus of an increase in apparent loudness of your station sound due to reverberation, as originally described by Dr. Maxfield.



## FAIRCHILD COMPACT COMPRESSOR MODEL 663

Allows creation of those up tight levels that contribute materially to presence and loudness combined with overload protection. The FAIRCHILD Model 663 Compact Compressor produces no distortion despite the amount of compression used... no thumps, no noise. The 663 provides adjustable release time and up to 20 db of compression. Model 663 NL comes with unity gain and additional gain if needed with +18 dbm output.



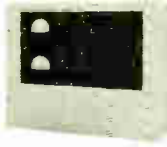
## FAIRCHILD PROGRAM EQUALIZER MODEL 664NL

An ideal no loss equalizer for broadcast and recording. The FAIRCHILD Model 664NL allows the production of the "hot, solid commercial" sound standard with major recording studios; transforms any conventional console into 'Big Board sound'. 1 1/2" x 5 1/4" high unit provides equalization up to 10 db at 4, 6, 8, 10, or 15 KHZ and low end equalization up to 10 db. Rolloffs also provided. The Model 664NLB has equalization at 2, 3, 4, 5, and 7.5 KHZ for motion picture demands. The FAIRCHILD Program Equalizer contains equalization plus 18 dbm amplifier output. Put life into your sound with the FAIRCHILD Equalizer.



## FAIRCHILD LIMITER MODEL 670

Fast attack Stereo Limiter (50 microseconds) with low distortion and absence of thumps. Sum and difference limiting position eliminates floating stereo image. Includes regular channel A and B limiting. Dual controls, dual meters provided. Used throughout the world. Flexible release times make it indispensable in stereo recording and broadcasting.



## Why are 6 FAIRCHILD CONAX'S on top of the EMPIRE STATE BUILDING?



Several New York FM and TV stations, including WNEW-TV, WPIX-FM, WPIX-TV, WOR-FM, WOR-TV, and WQXR-FM, value their transmission location on top of the Empire State Building and they also value their audience. The FAIRCHILD CONAX allows these stations to maintain high average listening levels without danger of over-modulation caused by high frequency spikes and thereby increasing fringe area coverage. The super-fast attack and release times of the FAIRCHILD CONAX makes this instantaneous control inaudible to the listener's ear. The FAIRCHILD CONAX does not "muddy-up" the top in an effort to control it. Easily integrated into existing systems, the FAIRCHILD CONAX does not obsolete conventional compressors or limiters — it actually improves their performance. Only the FAIRCHILD CONAX is the world accepted solution for high frequency pre-emphasis problems. Join the "1000 Club"... the satisfied users of the FAIRCHILD CONAX in recording and broadcasting throughout the world. Write to FAIRCHILD — the pacemaker in professional audio products — for complete details.

Write to FAIRCHILD — the pacemaker in professional audio products — for complete details.

# FAIRCHILD

RECORDING EQUIPMENT CORPORATION  
10-40 45th Ave., Long Island City 1, N. Y.

# FAIRCHILD

RECORDING EQUIPMENT CORPORATION  
10-40 45th Ave., Long Island City 1, N. Y.

SEMICONDUCTOR RECTIFIERS, SILICON CONTROLLED - SCR  
SEMICONDUCTORS, THYRISTORS  
SEMICONDUCTORS, TRANSISTORS, AF  
SEMICONDUCTORS, TRANSISTORS, FE  
SEMICONDUCTORS, TRANSISTORS, GENERAL  
SEMICONDUCTORS, TRANSISTORS, RF  
VACUUM TUBES, CATHODE RAY, TV, COLOR  
VACUUM TUBES, CATHODE RAY, TV, MONOCHROME  
VACUUM TUBES, RECEIVING  
VACUUM TUBES, TRANSMITTING

G E INDUSTRIAL SALES OPERATION

AMMETERS, AC  
AMMETERS, AC, THERMOCOUPLE  
AMMETERS, DC  
AMMETERS, RF  
CIRCUIT BREAKERS  
METERS, DB AND VU  
METERS, DB AND VU, WIDE RANGE  
SHUNTS, METER  
TRANSFORMERS, GENERAL  
VOLTMETERS, AC  
VOLTMETERS, DC  
WATTMETERS

G E CAPACITOR DEPARTMENT

BATTERIES, NICKEL CADMIUM  
CAPACITORS, FIXED, AIR  
CAPACITORS, FIXED, CERAMIC  
CAPACITORS, FIXED, MICA  
CAPACITORS, FIXED, OIL-FILLED  
CAPACITORS, FIXED, OTHER

G E SUPPLY COMPANY

CLOCKS  
METERS, LIGHT  
RECEIVERS, AM  
REGULATORS, CURRENT  
REGULATORS, VOLTAGE

G E SALES AND DISTRIBUTION

RECEIVERS, TV, COLOR  
RECEIVERS, TV, MONOCHROME

G E COMMUNICATION PRODUCTS

MOBILE EQUIPMENT

G E PICKUP TUBE OPERATION

VACUUM TUBES, CAMERA, IMAGE-ORTHICON  
VACUUM TUBES, CAMERA, VIDICON

GENERAL ELECTRIC COMPANY

AMMETERS, AC  
AMMETERS, DC  
BALLASTS, LAMP  
BATTERIES, NICKEL CADMIUM  
BATTERIES, OTHER  
BRIDGES  
CAPACITORS, FIXED, ELECTROLYTIC  
CAPACITORS, FIXED, FILM  
CAPACITORS, FIXED, OIL-FILLED  
CAPACITORS, FIXED, PAPER  
CAPACITORS, FIXED, OTHER  
CHARGERS, BATTERY  
CIRCUIT BREAKERS  
COMPUTER EQUIPMENT  
CONVERTERS  
DETECTORS, MICROWAVE  
DIVIDERS, FREQUENCY  
DIVIDERS, VOLTAGE  
FUSES  
GENERATORS, POWER, ELECTRIC MOTOR  
HEATING ELEMENTS  
INDUSTRIAL TV  
INTEGRATED CIRCUITS  
LIGHTNING ARRESTERS  
METERS, PHASE ANGLE  
MICROWAVE COMPONENTS  
PANELS, INSTRUMENT, FOR RACK MOUNTING  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC  
RECORDERS, PAPER, LOGGING AND GRAPHIC  
RECTIFIERS - ALSO SEE SEMI-CONDUCTORS & VACUUM TUBES  
RECTIFIERS, SELENIUM  
REGULATORS, CURRENT  
REGULATORS, VOLTAGE  
RELAYS, GENERAL PURPOSE  
RELAYS, LATCHING  
RELAYS, OVERLOAD  
RELAYS, PHOTOELECTRIC  
RELAYS, THERMAL  
RELAYS, TIME DELAY  
REMOTE CONTROL SYSTEMS  
RESISTORS, FIXED, WIREWOUND  
RESISTORS, FIXED, OTHER  
RHEOSTATS  
SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS, GENERAL  
SEMICONDUCTOR RECTIFIERS, POWER  
SEMICONDUCTOR RECTIFIERS, SILICON CONTROLLED - SCR  
SEMICONDUCTORS, TRANSISTORS, GENERAL  
SHUNTS, METER  
SWITCHES, FOOT  
SWITCHES, INTERLOCK  
SWITCHES, LEVER  
SWITCHES, MECHANICALLY ACTUATED

SWITCHES, PUSHBUTTON, NONILLUMINATED  
SWITCHES, ROTARY  
SWITCHES, THERMAL  
SWITCHES, TOGGLE  
TERMINAL BLOCKS  
TERMINAL BOARDS  
TESTERS, BATTERY  
TESTERS, INSULATION  
TIMERS, ELECTRIC  
TRANSFORMERS, AUTO  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
TRANSFORMERS, POWER  
TRANSFORMERS, VARIABLE  
TV SYSTEMS, CLOSED CIRCUIT  
VOLTMETERS, AC  
VOLTMETERS, DC  
WATTMETERS

GENERAL MICROWAVE CORPORATION

ANALYZERS, NOISE  
ATTENUATORS, FIXED  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
BRIDGES  
METERS, POWER  
METERS, STANDING WAVE  
WATTMETERS  
WAVEGUIDE AND ASSOCIATED COMPONENTS

GENERAL RADIO COMPANY

ADAPTERS, CONNECTOR  
AMPLIFIER, AF, GENERAL PURPOSE  
AMPLIFIER, DC  
AMPLIFIER, PULSE  
AMPLIFIER, RF, GENERAL PURPOSE  
AMPLIFIER, RF, POWER  
ANALYZERS, DISTORTION  
ANALYZERS, HARMONIC  
ANALYZERS, NOISE  
ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
BALUNS  
BOXES, DECADE, CAPACITOR  
BOXES, DECADE, INDUCTOR  
BOXES, DECADE, RESISTOR  
BRIDGES  
CABLE, ASSEMBLIES  
CABLE, COAXIAL, FLEXIBLE  
CAPACITORS, FIXED, AIR  
CAPACITORS, FIXED, MICA  
CAPACITORS, FIXED, OTHER  
CAPACITORS, VARIABLE  
CLOCKS  
CONNECTORS, AF & MICROPHONE  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, RF  
COUNTERS, FREQUENCY  
DELAY LINES  
DETECTORS, MICROWAVE  
DETECTORS, STANDING WAVE  
DIALS, INSTRUMENT  
DIVIDERS, FREQUENCY  
DIVIDERS, VOLTAGE  
FILTERS, AUDIO  
FILTERS, RF  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, RF  
GENERATORS, SIGNAL, SQUARE WAVE  
INDUCTANCES, FIXED  
INDUCTANCES, VARIABLE  
JACKS  
JOINTS, ROTARY, COAXIAL  
KNOBS  
METERS, FREQUENCY  
METERS, FREQUENCY CALIBRATING  
MICROWAVE COMPONENTS  
OSCILLATORS, AF AND RF, SEE GENERATORS  
OSCILLATORS, AM  
PLUGS, COAXIAL  
POTENTIOMETERS, WIREWOUND  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO  
RECORDERS, MAGNETIC TAPE, AUDIO  
RECORDERS, PAPER, LOGGING AND GRAPHIC  
REGULATORS, VOLTAGE  
RESISTORS, FIXED, NONINDUCTIVE  
RESISTORS, FIXED, PRECISION  
RESISTORS, FIXED, WIREWOUND  
RESISTORS, VARIABLE, WIREWOUND  
RHEOSTATS  
STROBE, DISCS  
STROBE, LIGHTS  
TESTERS, CAPACITOR  
TESTERS, INSULATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, AUTO  
TRANSFORMERS, VARIABLE  
VOLTMETERS, AC  
VOLTMETERS, DC  
VOLTMETERS, VACUUM TUBE

GENERAL TELEVISION NETWORK

PROJECTORS, TV, LARGE SCREEN  
STANDS, TELEVISION MONITOR

GIBBS MFG. & RESEARCH CORP.

CABLE, ASSEMBLIES  
CLOCKS  
CONVERTERS  
GENERATORS, FM, SUBCARRIER  
GENERATORS, SIGNAL, AF

GENERATORS, SIGNAL, MARKER  
GENERATORS, SIGNAL, PULSE  
GENERATORS, SIGNAL, RF  
GENERATORS, SIGNAL, SQUARE WAVE  
INVERTERS, DC TO AC, CHOPPER  
OSCILLATORS, AF AND RF, SEE GENERATORS  
OSCILLATORS, AM  
OSCILLATORS, FM  
OSCILLATORS, TV  
OSCILLATORS, OTHER  
POWER SUPPLIES, AC  
POWER SUPPLIES, PRECISION  
TIMERS, ELECTRIC

J W GIBSON CO., INC.

CLEANERS, CHEMICAL

GOTHAM AUDIO CORPORATION

ARMS, TONE  
ATTENUATORS, FIXED  
CABLE, COAXIAL, FLEXIBLE  
CABLE, SHIELDED, AUDIO  
CARTRIDGES, PHONO  
CONNECTORS, AF & MICROPHONE  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, KITS  
EARPHONES, HEADPHONES  
EDITORS, VIDEO TAPE  
EQUALIZERS, AUDIO EMPHASIS  
HEADS, DISC RECORDING  
LATHE, DISC RECORDING  
METERS, DB AND VU  
METERS, FLUTTER & WOW  
MICROPHONE HARDWARE  
MICROPHONE STANDS & BOOMS  
MICROPHONES, CONDENSER  
MIXERS - ALSO SEE CONSOLES  
MONITORS, FM SYSTEMS, STEREO  
OHMMETERS  
POTENTIOMETERS, CARBON  
RECORDERS, MAGNETIC TAPE, AUDIO  
REVERBERATION DEVICES  
TESTERS, BATTERY  
TESTERS, INSULATION  
TRANSFORMERS, AUDIO, ISOLATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, TRANSISTOR  
TURNTABLES, PHONOGRAPH  
VOLTMETERS, AC

HOUSTON FEARLESS CORP.

CAMERA, MOUNTING EQUIPMENT  
DOLLIES, CAMERA  
MICROPHONE STANDS & BOOMS  
PROCESSORS, FILM, B-W  
PROCESSORS, FILM, COLOR

GRADO LABORATORIES, INC.

CARTRIDGES, PHONO

GRANTHAM SCHOOLS

EDUCATION FACILITIES, SCHOOLS

GRAY RESEARCH & DEVELOPMENT CO

ARMS, TONE  
EQUALIZERS, AUDIO EMPHASIS  
LENSES, OPTICAL, FIXED  
PROJECTORS, SLIDE  
TURNTABLES, PHONOGRAPH

GREENLEE TOOL COMPANY

TOOLS, PUNCH, CHASSIS

GREGORY AMPLIFIER CORP

AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, REVERBERATION  
POWER SUPPLIES, AC  
PREAMPLIFIERS, AUDIO  
REVERBERATION DEVICES  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, PORTABLE  
SOUND SYSTEMS, THEATER  
SPEAKERS

GRINNAN FIXTURE COMPANY

CABINETS, STORAGE, DISC  
CABINETS, STORAGE, FILM  
CABINETS, STORAGE, MAGNETIC TAPE  
CABINETS, WOOD  
CONSOLE, CABINETS AND HARDWARE  
DISPLAY EQUIPMENT, TV  
SERVICES, INSTALLATION

GULF ELECTRO-SALES, INC.

SERVICES, INSTALLATION

G-V CONTROLS INC.

RELAYS, OVERLOAD  
RELAYS, THERMAL  
RELAYS, TIME DELAY  
SWITCHES, THERMAL  
TIMERS, ELECTRIC

HAMILTON HALL RESISTOR CORP.

RESISTORS, FIXED, WIREWOUND

HANCOCK TELECONTROL

AUTOMATION EQUIPMENT  
COMPUTER EQUIPMENT  
REMOTE CONTROL SYSTEMS  
SWITCHING SYSTEMS

HARTLEY PRODUCTS

ACOUSTIC MATERIALS  
ENCLOSURES, SPEAKER  
NETWORKS, MATCHING, AUDIO

SPEAKERS

HARVEY RADIO CO., INC.

COMPUTER EQUIPMENT  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, AM  
MIXERS - ALSO SEE CONSOLES  
REWINDERS, TAPE  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, PORTABLE  
SOUND SYSTEMS, THEATER  
TAPE DUPLICATORS

HARWALO COMPANY

CABINETS, STORAGE, DISC  
CABINETS, STORAGE, FILM  
EDITORS, FILM  
EDUCATION FACILITIES, EQPT  
PROJECTORS, SLIDE  
REELS, FILM  
REWINDERS, FILM  
SOLVENTS AND CLEANERS  
SPLICERS, MAGNETIC TAPE  
AND FILM

HARWOOD MFG. CO.

CABINETS, METAL  
LAMP ASSEMBLIES  
LIGHTING, TV, COMPONENTS

HAYDEN BOOK COMPANY

EDUCATION FACILITIES, PUBLISHERS

HEATH COMPANY

ADAPTERS, FM STEREO  
AMPLIFIER, AF, STEREO  
BOXES, DECADE, CAPACITOR  
BOXES, DECADE, RESISTOR  
BRIDGES  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS, INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS, INTERCOM, WIRELESS  
COMPUTER EQUIPMENT  
EARPHONES, HEADPHONES  
GENERATORS, FM, STEREO  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, COLOR BAR  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL, RF  
GENERATORS, SIGNAL, SQUARE WAVE  
KITS  
OHMMETERS  
OSCILLATORS, AF AND RF, SEE GENERATORS  
OSCILLATORS, AM  
OSCILLATORS, FM  
OSCILLATORS, TV  
OSCILLOSCOPES  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC  
POWER SUPPLIES, PRECISION  
RECEIVERS, AM  
RECEIVERS, FM  
RECEIVERS, MULTIPLEX  
RECEIVERS, TV, COLOR  
RECEIVERS, TV, MONOCHROME  
RECORDERS, MAGNETIC TAPE, AUDIO  
RECORDERS, PAPER, LOGGING AND GRAPHIC  
VOLTMETERS, AC  
VOLTMETERS, DC  
VOLTMETERS, VACUUM TUBE

HEINTZ & KAUFMAN, LTD

RECTIFIERS - VACUUM TUBES  
VACUUM TUBES, RECEIVING  
VACUUM TUBES, TRANSMITTING

HEWLETT - PACKARD CO.

ADAPTERS, CONNECTOR  
ADAPTERS, TEST  
AMMETERS, AC  
AMMETERS, DC  
AMMETERS, RF  
AMPLIFIER, VIDEO, SWEEP  
ANALYZERS, DISTORTION  
ANALYZERS, HARMONIC  
ANALYZERS, NOISE  
ANALYZERS, VIDEO  
ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
BRIDGES  
CALIBRATION SERVICE, FREQUENCY  
CALIBRATION SERVICE, INSTRUMENT  
CAMERAS, OSCILLOSCOPE  
CASES, PORTABLE, ELECTRONIC EQUIPMENT  
CLIPS, TEST  
COUNTERS, FREQUENCY  
DEGAMNETIZERS, BULK TAPE  
DETECTORS, MICROWAVE  
DETECTORS, STANDING WAVE  
GENERATORS, FM, STEREO  
GENERATORS, SIGNAL, PULSE  
GENERATORS, SIGNAL, RF  
INDUCTANCES, FIXED  
METERS, FREQUENCY  
METERS, FREQUENCY CALIBRATING  
METERS, PHASE ANGLE  
METERS, POWER  
METERS, STANDING WAVE  
METERS - SEE SPECIFIC TYPES  
MICROWAVE COMPONENTS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FREQUENCY

get complete coverage  
and combination rates  
in your Domestic  
and Foreign Markets

Look at the facts below to see how BROADCAST ENGINEERING and RADIO y TELEVISION give you complete coverage, both domestic and foreign, of the ever-expanding broadcast-communications market. And this complete coverage—almost 30,000 total circulation\*—is now available with money-saving combination rates in both magazines.

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\*November figures are projected totals based on business before adjustments. Any variation on the December 31st statement will be minimal.

## CIRCULATION FACTS

### Broadcast Engineering

November, 1966

123% INCREASE SINCE 1963—Circulation has increased almost 12,000 since 1963, giving you the most complete coverage of management and technical personnel of AM, FM, CATV and TV broadcast stations.

| BUSINESS AND INDUSTRY   |           | NOV    |
|---|-----------|--------|
| RADIO & TV STATIONS and NETWORKS:   |           |        |
| Classification by Title   |           |        |
| Owners, Presidents, Vice Presidents, general managers, and station managers |           | 5,418  |
| Chief engineers, engineers, supervisors and technicians                     |           | 9,202  |
| Company and other copies  |           | 624    |
|   | SUB TOTAL | 15,244 |
| CONSULTING ENGINEERS  |           | 817    |
| RECORDING STUDIOS   |           | 688    |
| MANUFACTURERS & DISTRIBUTORS of Electronic & other Broadcasting Equipment   |           | 1,914  |
| GOVERNMENT AGENCIES, LIBRARIES & SCHOOLS                                    |           | 1,075  |
| STUDENTS  |           | 194    |
| CLOSED CIRCUIT TV   |           | 21     |
| COMMUNITY ANTENNA & TELEVISION SYSTEMS                                      |           | 1,547  |
|   | TOTAL     | 21,500 |

### Radio y Television

November, 1966

Circulation is controlled with 8120 going to owners, management and technical personnel at all AM, FM and TV stations in Latin American countries, Spain and other Spanish and Portuguese-speaking areas of the world. In addition, RADIO y TELEVISION goes to wholesalers, agents, distributors and manufacturers of broadcast-related electronic equipment in all these countries . . . plus radio and television stations in the United States with Spanish and Portuguese programming.

|                    |      |                        |      |
|--------------------|------|------------------------|------|
| Argentina          | 598  | Nicaragua              | 105  |
| Bolivia            | 168  | Panama                 | 200  |
| Brazil             | 1081 | Paraguay               | 79   |
| Colombia           | 477  | Peru                   | 471  |
| Costa Rica         | 143  | Philippines            | 46   |
| Chile              | 363  | Portugal               | 176  |
| Dominican Republic | 175  | Puerto Rico            | 238  |
| Ecuador            | 342  | Spain                  | 490  |
| El Salvador        | 120  | Uruguay                | 216  |
| Guatemala          | 188  | USA (Spanish Stations) | 687  |
| Honduras           | 161  | Venezuela              | 400  |
| Mexico             | 1048 |                        |      |
| Miscellaneous      | 148  | TOTAL                  | 8120 |

Reach this  
Combined  
Circulation  
of 29,620  
at Lower Cost  
with  
Combination  
Rates

Combination rates with BROADCAST ENGINEERING and RADIO y TELEVISION are available on request. EXAMPLE: 12 insertions in each publication earn the 24-time rate in both, or 6 insertions in each earn the 12-time rate in both.

MONITORS, WAVEFORM  
OHMMETERS  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
OSCILLOSCOPES  
POWER SUPPLIES, OC  
POWER SUPPLIES, PRECISION  
PROBES, OSCILLOSCOPE  
PROBES, TEST LEAD  
RECORDERS, PAPER,  
LOGGING AND GRAPHIC  
SEMICONDUCTOR OIODES  
TELEPHONE EQUIPMENT\*  
VOLT METERS, AC  
VOLT METERS, DC  
VOLT METERS, VACUUM TUBE  
WAVEGUIDE AND  
ASSOCIATED COMPONENTS

#### HICKOK ELECTRICAL INSTRUMENTS

AMMETERS, AC  
AMMETERS, DC  
BRIGES  
COUNTERS, FREQUENCY  
GENERATORS, FM, STEREO  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, COLOR BAR  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL, MARKER  
GENERATORS, SIGNAL, PULSE  
GENERATORS, SIGNAL, RF  
METERS, FREQUENCY  
METERS, PHASE ANGLE  
METERS - SEE SPECIFIC TYPES  
OHMMETERS  
OSCILLATORS, AM  
OSCILLATORS, FM  
OSCILLATORS, TV  
OSCILLOSCOPES  
SWITCHES, MULTICONTACT  
TESTERS, BATTERY  
TESTERS, CAPACITOR  
TESTERS, SEMICONDUCTOR  
TESTERS, VACUUM TUBE  
TIMERS, ELECTRIC  
VOLT METERS, AC  
VOLT METERS, OC  
VOLT METERS, VACUUM TUBE

#### S. HIMMELSTEIN AND COMPANY

DELAY DEVICES, AF

#### HOLLAND ELECTRONICS INC.

ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
ATTENUATORS, RF  
ATTENUATORS, VIDEO  
CORDS, PATCH  
FILTERS, RF  
JACK PANEL ASSEMBLIES

#### HOLLINGSWORTH SOLDERLESS

TERMINAL COMPANY  
TERMINALS, LUG  
TERMINALS, SOLDERLESS  
TOOLS, CRIMPERS  
TOOLS, HAND

#### HOUSTON ELECTRONICS CO.

ALARM, FAULT  
ALARM, INTRUDER  
AMPLIFIER, SENSING  
BROADCAST PROGRAMMING SERVICE  
CIRCUIT BREAKERS  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
FLASHERS, TOWER  
LIGHTING, TV, CONTROLS  
MIXERS - ALSO SEE CONSOLES  
RELAYS, PHOTOELECTRIC  
RELAYS, TIME DELAY  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, PORTABLE  
SOUND SYSTEMS, THEATER

#### HUGHES & PHILLIPS

ALARM, FAULT  
FLASHERS, TOWER  
LAMP ASSEMBLIES  
RELAYS, LIGHT-INDICATING  
RELAYS, PHOTOELECTRIC  
TRANSFORMERS, AUTO  
TRANSFORMERS, POWER

#### HUNT-PIERCE CORP

LIFTS, AERIAL, TRUCK-MOUNTED

#### HY-GAIN ELECTRONICS

ANTENNAS, CATV  
ANTENNAS, MOBILE  
TOWERS, ANTENNA,  
CATV, HEAD-END

#### IMPEX ELECTRONICS

ADAPTERS, CONNECTOR  
ADAPTERS, FM STEREO  
BATTERIES, LEAD ACID  
BATTERIES, NICKEL CADMIUM  
CHARGERS, BATTERY  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
TAPE DECKS, MAGNETIC  
TAPE, MAGNETIC RECORDING,  
AUDIO

#### INDUSTRIAL DEVICES

CLIPS, TEST  
LAMP ASSEMBLIES

LAMPS, GLOW  
LAMPS, PANEL  
REELS, CABLE, AUTOMATIC  
SWITCHES, ROTARY

#### INDUSTRIAL ELECTRIC REELS

REELS, CABLE, AUTOMATIC

#### INSTRUMENT LABORATORIES CORP.

AMMETERS, AC  
AMMETERS, DC  
CALIBRATION SERVICE,  
INSTRUMENT  
GENERATORS, SIGNAL, AF  
OHMMETERS  
VOLT METERS, AC  
VOLT METERS, VACUUM TUBE

#### INTERNATIONAL GOOD MUSIC

AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, SENSING  
AUTOMATION EQUIPMENT  
BACKGROUND MUSIC SERVICE  
BROADCAST PROGRAMMING SERVICE  
CARTRIDGES, MAGNETIC TAPE  
CATV, HEAD-END EQUIPMENT  
GENERATORS, SIGNAL, AF  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
SWITCHES  
SWITCHING SYSTEMS  
TAPE DECKS, MAGNETIC

#### INTERNATIONAL NUCLEAR CORP

AMPLIFIER, BRIDGING  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, STABILIZING  
AMPLIFIER, TV, VIDEO  
CONSOLE, AUDIO, TV  
MODULATORS, TV  
POWER SUPPLIES, OC  
SWITCHES  
SWITCHES, CROSSBAR  
SWITCHING MATRIXES  
SWITCHING SYSTEMS

#### INTERNATIONAL RECTIFIER

HEAT SINKS  
RECTIFIERS - ALSO  
SEE SEMICONDUCTORS  
RECTIFIERS, SELENIUM  
SEMICONDUCTOR OIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTOR RECTIFIERS,  
POWER  
SEMICONDUCTOR RECTIFIERS,  
SILICON CONTROLLED - SCR

SEMICONDUCTORS, THYRISTORS  
SEMICONDUCTORS,  
TRANSISTORS, AF  
SEMICONDUCTORS, TRANSISTORS,  
GENERAL  
SEMICONDUCTORS,  
TRANSISTORS, RF

#### IRC, INC.

DIVIDERS, VOLTAGE  
POTENTIOMETERS, CARBON  
POTENTIOMETERS, WIREWOUND  
RECTIFIERS, SELENIUM  
RESISTORS, FIXED, CARBON  
RESISTORS, FIXED,  
NONINDUCTIVE  
RESISTORS, FIXED, PRECISION  
RESISTORS, FIXED, WIREWOUND  
RESISTORS, FIXED, OTHER  
RESISTORS, VARIABLE,  
WIREWOUND  
SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
SILICON CONTROLLED - SCR  
SEMICONDUCTORS, THYRISTORS

#### ITI ELECTRONICS

DISPLAY EQUIPMENT, TV  
INDUSTRIAL TV  
INVERTERS, DC TO AC,  
SOLID STATE  
OSCILLOSCOPES

#### ITT CANNON ELECTRIC

DECK, ASSEMBLIES  
CONNECTORS, AF & MICROPHONE  
CONNECTORS, ANTENNA  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, POWER  
CONNECTORS, RF  
FILTERS, RF  
INTEGRATED CIRCUITS  
WIRING AND CABLING SERVICES

#### ITT TELECOMMUNICATIONS

COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
COMMUNICATIONS SYSTEMS,  
MULTIPLEX  
OIALS, TELEPHONE  
MICROWAVE SYSTEMS, 2500 MHZ  
RELAYS, TELEPHONE  
SWITCHES, CROSSBAR  
SWITCHES, TELEPHONE TYPE  
SWITCHING SYSTEMS, TELEPHONE  
TELEPHONE EQUIPMENT

#### ITT WIRE & CABLE DIV

CABLE, COAXIAL, FLEXIBLE

CABLE, COAXIAL, RIGID  
CABLE, DIRECT-BURIAL  
CABLE, TELEPHONE  
CORDS, SET  
FUSES  
WIRE, INSULATED, HIGH VOLTAGE  
WIRE, INSULATED, HOOKUP  
WIRE, SHIELDED

#### JAMPRO ANTENNA COMPANY

ANTENNAS, AM  
ANTENNAS, CATV  
ANTENNAS, FM  
ANTENNAS, TV  
ANTENNAS, 2500 MHZ  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
DIPLEXERS  
DUMMY LOAD  
FILTERS, ANTENNA  
FILTERS, RF  
FILTERS, HYBRID  
PLUGS, COAXIAL  
SWITCHES, COAXIAL  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV  
TRANSMISSION LINES  
VESTIGIAL SIDEBAND FILTERS  
WIRE, BARE, COPPER  
WIRE, BARE, COPPER STRAP

#### JENNINGS RADIO

CAPACITORS, FIXED, CERAMIC  
CAPACITORS, FIXED, OTHER  
CAPACITORS, VARIABLE  
DIVIDERS, VOLTAGE  
RELAYS, COAXIAL  
RELAYS, GENERAL PURPOSE  
RELAYS, LATCHING  
RELAYS, OVERLOAD  
RELAYS, POWER  
RELAYS, STEPPING  
SWITCHES  
SWITCHES, COAXIAL  
SWITCHES, CROSSBAR  
SWITCHES, MECHANICALLY  
ACTUATED  
SWITCHES, ROTARY  
SWITCHING MATRIXES  
SWITCHING SYSTEMS

#### JENSEN MANUFACTURING DIVISION

EARPHONES, HEADPHONES  
EDUCATION FACILITIES,  
PUBLISHERS  
EDUCATION FACILITIES, EOPT  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, PORTABLE  
SOUND SYSTEMS, THEATER  
SPEAKER COMPONENTS  
SPEAKERS

#### JERROLD ELECTRONICS

ADAPTERS, CONNECTOR  
ADAPTERS, TEST  
ALARM, FAULT  
AMPLIFIER, BRIDGING  
AMPLIFIER, CATV  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, TV, BOOSTER  
ANTENNAS, AM  
ANTENNAS, CATV  
ANTENNAS, FM  
ANTENNAS, MICROWAVE  
ANTENNAS, MOBILE  
ANTENNAS, TV  
ANTENNAS, TV,  
MASTER-COMMUNITY  
ANTENNAS, 2500 MHZ  
ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
BALUNS  
BRIDGES  
CABINETS, METAL  
CABLE, ASSEMBLIES  
CABLE, CATV, HARDWARE  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
CABLE, DIRECT-BURIAL  
CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
CATV, CABLE TERMINALS  
CATV, CHANNEL AMPLIFIERS  
CATV, HEAD-END EQUIPMENT  
CATV, ORIGINATION EQUIPMENT  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
CONNECTORS, ANTENNA  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, RF  
CONVERTERS  
DELAY LINES  
DEMODULATORS  
DETECTORS, MICROWAVE  
FILTERS, ANTENNA  
FILTERS, RF  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, MARKER  
GENERATORS, SIGNAL, RF  
GENERATORS, SIGNAL,  
SQUARE WAVE  
HEAD-END EQUIPMENT,  
SEE CATV HEAD-END EQUIPMENT  
INDUSTRIAL TV  
METERS, FIELD STRENGTH  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, STL

MICROWAVE SYSTEMS, 2500 MHZ  
MICROWAVE SYSTEMS, OTHER  
MODULATORS, TV  
MOUNTS, ANTENNA, FIXED  
NETWORKS, PHASING  
POWER SUPPLIES, AC  
PREAMPLIFIERS, VIDEO  
RADOMES  
STL EQUIPMENT  
SWITCHES, COAXIAL  
SWITCHES, ROTARY  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TRANSMISSION LINES  
TV SYSTEMS, CLOSED CIRCUIT  
WAVEGUIDE AND  
ASSOCIATED COMPONENTS

#### JETRONIC INDUSTRIES

AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, STEREO  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
TAPE DECKS, MAGNETIC

#### J. M. ELECTRONICS CO.

COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
MOBILE EQUIPMENT  
TV SYSTEMS, CLOSED CIRCUIT

#### JOA CARTRIDGE SERVICE

CARTRIDGES, MAGNETIC TAPE  
DEMAGNETIZERS, BULK TAPE  
DEMAGNETIZERS, HEAD  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
MAINTENANCE SERVICES,  
CARTRIDGE, TAPE  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
TAPE, MAGNETIC RECORDING,  
AUDIO  
VACUUM TUBES, TRANSMITTING

#### E. F. JOHNSON COMPANY

AMPLIFIER, RF, POWER  
CAPACITORS, VARIABLE  
COILS, CHOKE, RF  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRELESS  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
COUPLERS  
HARDWARE, PANEL  
HOLDERS, CRYSTAL  
INDUCTANCES, FIXED  
INDUCTANCES, VARIABLE  
INSULATORS, ANTENNA  
INSULATORS, FEED THROUGH  
INSULATORS, STAND-OFF  
INSULATORS, OTHER  
JACKS  
MOBILE EQUIPMENT  
PROBES, TEST LEAD  
RELAYS, ANTENNA  
SOCKETS, CRYSTAL  
SOCKETS, LAMP  
SOCKETS, TUBE  
SWITCHES, KNIFE  
SWITCHES, SNAP  
TRANSMITTER KITS  
TRANSMITTERS, AM, 250 WATT  
TRANSMITTERS, AM, 1 KW

#### JOHNSON ELECTRONICS, INC.

AMPLIFIER, AF, MONAURAL  
RECEIVERS, FM  
RECEIVERS, HF  
RECEIVERS, MULTIPLEX  
RECEIVERS, MULTIPLEX

#### JORDAN ELECTRIC COMPANY

ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
BOXES, DECADE, RESISTOR  
RESISTORS, FIXED, PRECISION  
RESISTORS, FIXED, WIREWOUND

#### KAHN RESEARCH LABORATORIES

AMPLIFIER, AF,  
PEAK LIMITING, AM  
CONVERTERS  
EXCITERS, FM  
RECEIVERS, AM  
RECEIVERS, HF

#### KAISER-COX

AMPLIFIER, CATV  
ANTENNAS, CATV  
CABLE, CATV, HARDWARE  
CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
CATV, CABLE TERMINALS  
CATV, CHANNEL AMPLIFIERS  
CATV, HEAD-END EQUIPMENT  
CATV, ORIGINATION EQUIPMENT  
CONNECTORS, COAXIAL CABLE  
HEAD-END EQUIPMENT,  
SEE CATV HEAD-END EQUIPMENT  
TV SYSTEMS, CLOSED CIRCUIT

#### THE KALART COMPANY

EDITORS, FILM  
PROJECTORS, FILM  
PROJECTORS, SLIDE  
SPLICERS, MAGNETIC TAPE  
AND FILM  
TV SYSTEMS, CLOSED CIRCUIT,  
PROJECTORS

#### KAPPA NETWORKS, INC.

DELAY LINES  
FILTERS, RF  
INDUCTANCES, FIXED

INDUCTANCES, VARIABLE  
TRANSFORMERS, RF

#### KARG LABORATORIES

ADAPTERS, FM STEREO  
AMPLIFIER, AF, STEREO  
GENERATORS, FM, STEREO  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, STEREO  
RECEIVERS, FM  
RECEIVERS, MULTIPLEX  
RECEIVERS, SCA

#### MATHIAS KLEIN & SONS

TOOLS, CRIMPERS  
TOOLS, CUTTERS  
TOOLS, HAND  
TOOLS, PLIERS  
TOOLS, SCREWDRIVERS  
TOOLS, WRENCHES

#### KLINE IRON & STEEL COMPANY

TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

#### KOSS ELECTRONICS

AMPLIFIER, AF, STEREO  
ARMS, TONE  
EARPHONES, HEADPHONES  
HEADS, DISC RECORDING  
LATHE, DISC RECORDING  
PREAMPLIFIERS, AUDIO  
SPEAKERS  
TURNTABLES, PHONOGRAPH

#### HERB KRECKMAN CO

ANTENNAS, MOBILE  
ANTENNAS, REMOTE PICKUP

#### KRS INSTRUMENTS DIVISION

ANALYZERS, VIDEO  
AUTOMATION EQUIPMENT  
CARTRIDGES, MAGNETIC TAPE  
EDUCATION FACILITIES, EOPT  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
AUDIO, CARTRIDGE  
RECORDERS, MAGNETIC TAPE,  
LOGGING  
TAPE DECKS, MAGNETIC  
TAPE, RECORDING, GRAPHIC

#### LACROSSE ELECTRONICS

RECORDERS, MAGNETIC TAPE,  
AUDIO, CARTRIDGE

#### LAFAYETTE RADIO ELECTRONICS

TRANSFORMERS, AUDIO,  
ISOLATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, AUDIO,  
POWER OUTPUT  
TRANSFORMERS, AUTO  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
TRANSFORMERS, POWER  
TRANSFORMERS, TRANSISTOR

#### LAKE ELECTRONICS, INC.

COILS, DEFLECTION  
AND FOCUSING  
CONSOLE, AUDIO, TV  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL, MARKER  
GENERATORS, SIGNAL, PULSE  
GENERATORS, SIGNAL,  
SQUARE WAVE  
GENERATORS, SIGNAL,  
TV, SYNCHRONIZING  
INDUCTANCES, FIXED  
INDUSTRIAL TV  
LENSES, OPTICAL, ZOOM  
MONITORS, VIDEO  
SEMICONDUCTORS,  
TRANSISTORS, AF  
SEMICONDUCTORS, TRANSISTERS,  
GENERAL  
SPEAKERS  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, AUDIO,  
POWER OUTPUT  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
TRANSFORMERS, PLATE  
TRANSFORMERS, POWER  
TRANSFORMERS, RF  
TRANSFORMERS, TRANSISTOR  
TRANSFORMERS, VARIABLE  
YOKES, DEFLECTION

#### LAMPKIN LABORATORIES

METERS, FREQUENCY  
METERS - SEE SPECIFIC TYPES  
MONITORS, FREQUENCY  
MONITORS, MODULATION

#### LANG ELECTRONICS, INC.

AMPLIFIER, AF,  
GENERAL PURPOSE  
CABINETS, METAL  
CABINETS, WOOD  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, CABINETS  
AND HARDWARE  
MIXERS - ALSO SEE CONSOLES  
STROBE, DISCS  
TAPE DUPLICATORS

#### LANGEVIN

AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, BRIDGING  
ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
EQUALIZERS, AUDIO EMPHASIS  
FILTERS, AUDIO  
NETWORKS, MATCHING, AUDIO  
POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO  
SWITCHES, MULTICONTACT  
SWITCHES, ROTARY

#### JAMES B. LANSING SOUND CO.

AMPLIFIER, AF, STEREO  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, THEATER  
SPEAKER COMPONENTS  
SPEAKERS

#### LAVIOLETTE ELECTRONICS

MONITORS, VIDEO

#### LENKVURT ELECTRIC CO.

COMMUNICATIONS SYSTEMS,  
MICROWAVE  
COMMUNICATIONS SYSTEMS,  
MULTIPLEX  
MICROWAVE SYSTEMS, STL

#### LENZ ELECTRIC MFG. COMPANY

CABLE, SHIELDED, AUDIO  
CABLE, TELEPHONE  
WIRE, INSULATED, HIGH VOLTAGE  
WIRE, INSULATED, HOOKUP  
WIRE, SHIELDED

#### LEWIS AND KAUFMAN LTD.

VACUUM TUBES, BALLAST  
VACUUM TUBES, CAMERA, VIDICON  
VACUUM TUBES, CATHODE RAY,  
TV, MONOCHROME  
VACUUM TUBES, RECEIVING  
VACUUM TUBES, TRANSMITTING

#### LIBERTY TOWER MFG. CO.

ANCHORS, GUY  
MAINTENANCE SERVICES, AM  
MAINTENANCE SERVICES, FM  
MAINTENANCE SERVICES,  
MICROWAVE  
MAINTENANCE SERVICES,  
STEEPLEJACK  
MOUNTS, ANTENNA, FIXED  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

#### LIGHTING & ELECTRONICS

LIGHTING, TV, COMPONENTS  
LIGHTING, TV, CONTROLS  
LIGHTING, TV, SYSTEMS

#### LINDSAY SPECIALTY PRODUCTS LTD.

AMPLIFIER, BRIDGING  
AMPLIFIER, CATV  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, TV, BOOSTER  
ANTENNAS, CATV  
ANTENNAS, FM  
ANTENNAS, MOBILE  
ANTENNAS, TV  
ANTENNAS, TV,  
MASTER-COMMUNITY

#### LIPPS, INC.

HEADS, DISC RECORDING  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC

#### LITTELFUSE

CIRCUIT BREAKERS  
FUSES  
HOLDERS, FUSE

#### LITTLE JOE ENTERPRISES

ANCHORS, GUY  
CABINETS, WOOD  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, CABINETS  
AND HARDWARE  
CONSOLE, AUDIO, AM  
DUMMY LOAD  
MAINTENANCE SERVICES, AM  
MAINTENANCE SERVICES, FM  
MAINTENANCE SERVICES,  
STEEPLEJACK  
REVERBERATION DEVICES  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM

#### LITTEN EDUCATIONAL TELEVISION

ANTENNAS, MICROWAVE  
ANTENNAS, 2500 MHZ  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, STL  
MICROWAVE SYSTEMS, 2500 MHZ  
TRANSLATOR SYSTEMS  
TV SYSTEMS, CLOSED CIRCUIT

# for TOP PERFORMANCE in FM ANTENNAS

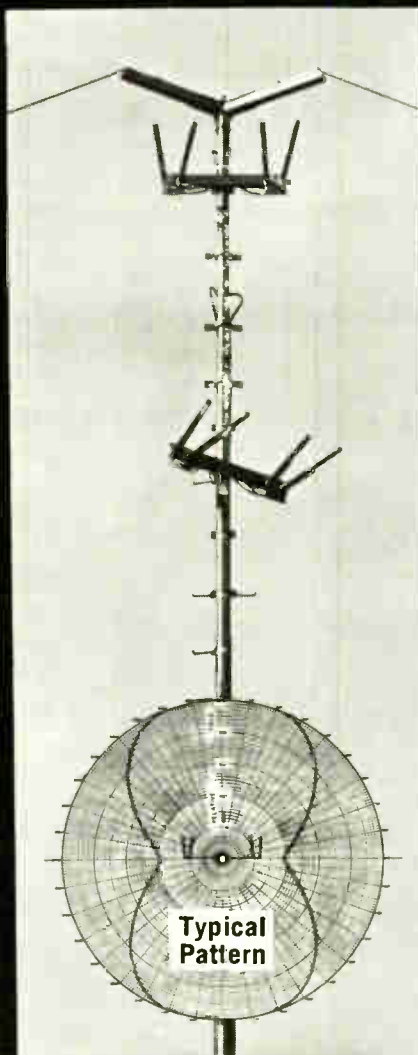
## DUAL POLARIZED



### DESCRIPTION

Any combination of elements  
Any power split from 50-50 to 30-70  
Can be mounted, interlace,  
stacked or back to back  
Mounting hardware furnished for  
your tower.

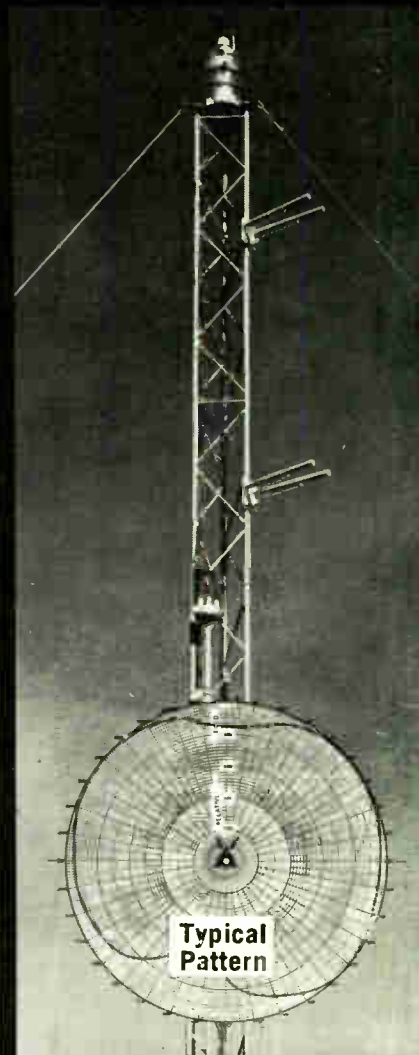
## DIRECTIONALIZED



### DESCRIPTION

Phased directional (shown)  
Parasitic Directional  
Can be made for pole or tower  
mount.  
Complete filing information  
furnished along with  
certified pattern

## HORIZONTAL



### DESCRIPTION

Basic Jampro design with  
in phase signal over full  
modulation swing by use of  
power divider feed system.  
Input power up to 50 kw  
Complete with  
all hardware

# J A M P R O

- TV Antennas
- Coax Switches
- Notch Diplexers
- FM Antennas
- Harmonic Filters
- ETV Antennas

**ANTENNA**  
6939 POWER INN ROAD

**COMPANY**  
SACRAMENTO CALIFORNIA

PHONE  
AREA CODE 916  
**422-1177**

LOW POWER BROADCAST EQUIP CO  
CARRIER-CURRENT EQUIPMENT  
TRANSMITTERS, AM, LOW POWER

MACARTA INC

AUTOMATION EQUIPMENT  
CARTRIDGES, MAGNETIC TAPE  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
TAPE, MAGNETIC RECORDING,  
AUDIO

THE MACHLETT LABORATORIES  
VACUUM TUBES, TRANSMITTING

MACKENZIE LABORATORIES

AUTOMATION EQUIPMENT  
CARTRIDGES, MAGNETIC TAPE  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
AUDIO, CARTRIDGE  
TAPE DECKS, MAGNETIC

MAGNA-TECH CORPORATION  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
TAPE DECKS, MAGNETIC  
TAPE DUPLICATORS

MAGNECORD

AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, STEREO  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
LOGGING  
REELS, TAPE  
TAPE DECKS, MAGNETIC  
TAPE DUPLICATORS

MAGNETIC MEDIA CORPORATION  
CARTRIDGES, MAGNETIC TAPE  
TAPE, MAGNETIC RECORDING,  
AUDIO  
TAPE, MAGNETIC RECORDING,  
COMPUTER  
TAPE, MAGNETIC RECORDING,  
VIDEO

MAGNE-TRONICS, INC.  
BACKGROUND MUSIC SERVICE

MALLODY DISTRIBUTOR PRODUCTS

ALARM, FAULT  
ATTENUATORS, AUDIO  
CAPACITORS, FIXED, CERAMIC  
CAPACITORS, FIXED,  
ELECTROLYTIC  
CAPACITORS, FIXED, FILM  
CAPACITORS, FIXED, OTHER  
CIRCUIT BREAKERS  
DIALS, INSTRUMENT  
JACKS  
KNOBS  
PLUGS, PHONE  
RESISTORS, FIXED, PRECISION  
RESISTORS, FIXED, WIREWOUND  
RESISTORS, VARIABLE, CARBON  
RESISTORS, VARIABLE,  
WIREWOUND  
RHEOSTATS  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
POWER  
SWITCHES, LEVER  
SWITCHES, PUSHBUTTON,  
NONILLUMINATED  
SWITCHES, ROTARY  
TESTERS, BATTERY  
TIMERS, ELECTRIC

MARANTZ COMPANY

AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, STEREO  
CABINETS, WOOD  
PREAMPLIFIERS, AUDIO  
RECEIVERS, FM  
RECEIVERS, MULTIPLEX  
TURNTABLES, PHONOGRAPH

MARATHON PRODUCTS CORP.

CARTRIDGES, MAGNETIC TAPE  
CARTRIDGES, TAPE,  
RECORDING SERVICE

MARCONI DIVISION

AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, STABILIZING  
AMPLIFIER, TV, VIDEO  
ANTENNAS, TV  
CAMERAS, TV, COLOR  
CAMERAS, TV, MONOCHROME  
DISPLAY EQUIPMENT, TV  
ENHANCERS, TV IMAGE  
EXCITERS, FM  
GENERATORS, SIGNAL, COLOR BAR  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
INDUSTRIAL TV  
MODULATORS, TV  
MONITORS, VIDEO  
MONITORS, WAVEFORM  
PROJECTORS, FILM  
RECEIVERS, HF  
RECEIVERS, AM, 1 KW  
TRANSMITTERS, AM, 10 KW  
TRANSMITTERS, AM, 50 KW

TRANSMITTERS, AM, OVER 50 KW  
TRANSMITTERS, FM, 1 KW  
TRANSMITTERS, FM, 5 KW  
TRANSMITTERS, TV, 1 KW  
TRANSMITTERS, TV, 5 KW  
TRANSMITTERS, TV, 10 KW  
TRANSMITTERS, TV, 25 KW  
TV SYSTEMS, CLOSED CIRCUIT

MARCONI INSTRUMENTS

ANALYZERS, DISTORTION  
ANALYZERS, HARMONIC  
ATTENUATORS, RF  
BRIDGES  
CALDRIMETERS  
GENERATORS, FM, STEREO  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, RF  
METERS, POWER  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
OSCILLATORS, AM  
OSCILLATORS, FM  
OSCILLATORS, OTHER  
RECEIVERS, AM  
RECEIVERS, FM  
RECEIVERS, HF

MARTI ELECTRONICS

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
ANTENNAS, FM  
ANTENNAS, MOBILE  
BASE STATIONS  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
EXCITERS, FM  
GENERATORS, FM, SUBCARRIER  
MICROWAVE SYSTEMS, STL  
MOBILE EQUIPMENT  
NARROW-BAND FM EQUIPMENT  
PREAMPLIFIERS, AUDIO  
RECEIVERS, FM  
RECEIVERS, SCA  
REMOTE CONTROL SYSTEMS  
STL EQUIPMENT  
TRANSMITTERS, FM, 10 WATTS  
TRANSMITTERS, FM, 100 WATTS

MARYLAND TELECOMMUNICATIONS

CAMERAS, TV, MONOCHROME  
CONSOLE, AUDIO, TV  
CONSOLE, VIDEO, STUDIO  
DISPLAY EQUIPMENT, TV  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
INDUSTRIAL TV  
MONITORS, VIDEO  
TV SYSTEMS, CLOSED CIRCUIT

MASTER TOWER CO

REFLECTORS, PASSIVE  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

J. G. MCALISTER

LAMPS, PANEL  
LIGHTING, TV, COMPONENTS  
LIGHTING, TV, SYSTEMS

THE MCINTIRE COMPANY

PRESSURIZATION EQUIPMENT,  
TRANSMISSION LINE

MCARTIN INDUSTRIES

ADAPTERS, FM STEREO  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, RF, PEAK LIMITING  
AMPLIFIER, RF, POWER  
ANTENNAS, FM  
BACKGROUND MUSIC SERVICE  
CABINETS, METAL  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS,  
MULTIPLEX  
HARDWARE, RACK  
METERS, DB AND VU  
METERS, FIELD STRENGTH  
METERS, FREQUENCY  
METERS - SEE SPECIFIC TYPES  
MICROPHONES, DYNAMIC  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, SCA  
MONITORS, FM SYSTEMS, STEREO  
MONITORS, FREQUENCY  
PREAMPLIFIERS, AUDIO  
RECEIVERS, FM  
RECEIVERS, MULTIPLEX  
RECEIVERS, SCA  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, PORTABLE  
SOUND SYSTEMS, THEATER  
SPEAKERS  
STL EQUIPMENT

MELCOR ELECTRONICS

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING

AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, STEREO  
AMPLIFIER, DC  
AMPLIFIER, DISTRIBUTION  
EQUALIZERS, AUDIO EMPHASIS  
MONITORS, AM SYSTEMS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, STEREO  
POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO

MEMOREX CORPORATION

TAPE, MAGNETIC RECORDING,  
COMPUTER  
TAPE, MAGNETIC RECORDING,  
VIDEO

METROPOLITAN ELECTRIC MFG. CO.

CABINETS, METAL  
LIGHTING, TV, COMPONENTS  
LIGHTING, TV, CONTROLS  
LIGHTING, TV, SYSTEMS  
SWITCHES, KNIFE

METROTECH INCORPORATED

RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
LOGGING

MICOM, INC

METERS, FLUTTER & WOW

MICROFLECT CO., INC.

REFLECTORS, PASSIVE  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

MICROLAB/FXR

ADAPTERS, TEST  
ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
CAVITIES, MICROWAVE  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
COUPLERS  
DETECTORS, MICROWAVE  
DETECTORS, STANDING WAVE  
DIPLEXERS  
DIVIDERS, POWER  
DUMMY LOAD  
FILTERS, RF  
HOLDERS, CRYSTAL  
METERS, FREQUENCY  
METERS, FREQUENCY CALIBRATING  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, STL  
MICROWAVE SYSTEMS, 2500 MHZ  
MICROWAVE SYSTEMS, OTHER  
METERS - ALSO SEE CONSOLES  
MONITORS, FREQUENCY  
MONITORS, PHASE  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
SEMICONDUCTOR DIODES  
SLOTTED SECTIONS  
SWITCHES, COAXIAL  
SWITCHES, WAVEGUIDE  
TRANSFORMERS, RF  
WAVEGUIDE AND  
ASSOCIATED COMPONENTS

MICRO-LINK SYSTEMS

ANTENNAS, MICROWAVE  
CAVITIES, MICROWAVE  
CHOKES, WAVEGUIDE  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
DETECTORS, MICROWAVE  
DETECTORS, STANDING WAVE  
DISPLAY EQUIPMENT, TV  
JOINTS, ROTARY, COAXIAL  
JOINTS, ROTARY, WAVEGUIDE  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, STL  
MICROWAVE SYSTEMS, 2500 MHZ  
MICROWAVE SYSTEMS, OTHER  
SLOTTED SECTIONS  
STL EQUIPMENT  
TV SYSTEMS, CLOSED CIRCUIT  
WAVEGUIDE AND  
ASSOCIATED COMPONENTS

MICROMEGA

AMPLIFIER, CATV  
AMPLIFIER, RF,  
GENERAL PURPOSE

MICRO RECORD CORP.

PROCESSORS, FILM, B-W  
PROCESSORS, FILM, COLOR

MICROWAVE ASSOCIATES, INC.

ADAPTERS, CONNECTOR  
AMPLIFIER, PULSE  
AMPLIFIER, RF, PEAK LIMITING  
AMPLIFIER, RF, POWER  
AMPLIFIER, TV, BOOSTER  
ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF

CAVITIES, MICROWAVE  
CHOKES, WAVEGUIDE  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
CONNECTORS, RF  
CONVERTERS  
COUPLERS  
DELAY LINES  
DETECTORS, MICROWAVE  
DIPLEXERS  
DIVIDERS, FREQUENCY  
FILTERS, RF  
GENERATORS, SIGNAL, RF  
HOLDERS, CRYSTAL  
INTEGRATED CIRCUITS,  
MICROWAVE  
JOINTS, ROTARY, WAVEGUIDE  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, STL  
MICROWAVE SYSTEMS, OTHER  
MOBILE EQUIPMENT  
PREAMPLIFIERS, AUDIO  
RACKS, MOUNTING  
SEMICONDUCTOR DIODES  
SHIFTERS, PHASE, MICROWAVE  
SWITCHES, COAXIAL  
SWITCHES, WAVEGUIDE  
TRANSMISSION LINES  
VACUUM TUBES, RECEIVING  
VACUUM TUBES, TRANSMITTING  
WAVEGUIDE AND  
ASSOCIATED COMPONENTS

MID AMERICA ELECTRONICS CORP

AMPLIFIER, AF,  
GENERAL PURPOSE  
AUTOMATION EQUIPMENT  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, VIDEO, STUDIO  
SOUND SYSTEMS, THEATER

MILES REPRODUCER CO

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AMPLIFIER, RF, POWER  
CARTRIDGES, MAGNETIC TAPE  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRELESS  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
EQUALIZERS, AUDIO EMPHASIS  
MICROPHONES, DYNAMIC  
MICROPHONES, WIRELESS  
PREAMPLIFIERS, AUDIO  
RECEIVERS, FM  
RECORDERS, DISC, MAGNETIC  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
LOGGING  
TRANSFORMERS, AUDIO,  
POWER OUTPUT  
TRANSMITTER KITS  
TRANSMITTERS, FM,  
UP TO 1 WATT

J. W. MILLER COMPANY

INDUCTANCES, FIXED  
INDUCTANCES, VARIABLE  
TRANSFORMERS, RF

D. B. MILLIKEN COMPANY

CAMERAS, FILM, CINE  
CAMERAS, OSCILLOSCOPE

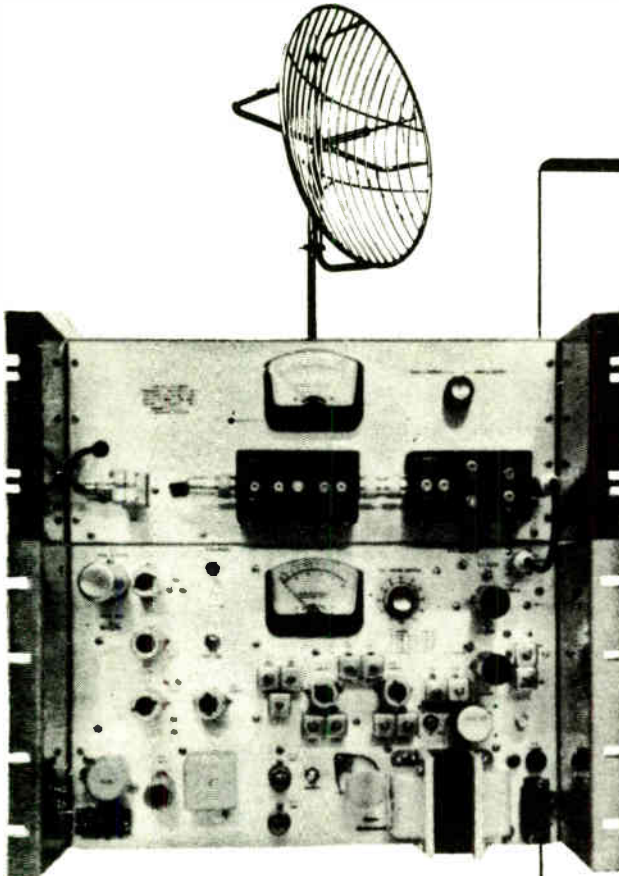
MINNEAPOLIS MAGNETICS

HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
TAPE, MAGNETIC RECORDING,  
TEST

MINNESOTA MINING & MFG. CO.

ALARM, SIGNAL  
BACKGROUND MUSIC SERVICE  
CABINETS, STORAGE, FILM  
CABINETS, STORAGE,  
MAGNETIC TAPE  
CAMERAS, FILM, CINE  
CAMERAS, FILM, STILL  
CAPACITORS, FIXED, CERAMIC  
CAPACITORS, FIXED, MICA  
CARTRIDGES, MAGNETIC TAPE  
COMPUTER EQUIPMENT  
CONVERTERS  
COPYING EQUIPMENT  
CRYSTALS, PIEZOELECTRIC  
DECALCOMANIAS  
DROPOUT COMPENSATOR,  
VIDEOTAPE  
EDITORS, FILM  
FILM, PHOTOGRAPHIC  
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HARDWARE, TUBING, PLASTIC  
HEADS, RECORDING, MAGNETIC  
LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
MOUNTS, VIBRATION AND SHOCK  
NAMEPLATES  
PAPER, CHART AND GRAPH  
RECORDERS, FILM, LIGHT  
RECORDERS, FILM, MAGNETIC  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
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REELS, TAPE  
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Marti STL and RPU equipment is specifically designed, engineered, and manufactured to provide two basic advantages for you, the Broadcaster. First, the equipment is unique because it reduces your monthly line charges while increasing the revenue derived from greater flexibility in your remote programming. Secondly, it provides program quality and reliability at least equal to, and usually better than, its land counterpart.

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Perfect  
them...!*



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- Communication Transmitters & Receivers
- FM Rebroadcast Receivers
- Transmission Line & Fittings
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AUDIO, CARTRIDGE  
TAPE, MAGNETIC RECORDING,  
COMPUTER  
TAPE, MAGNETIC RECORDING,  
TEST  
TAPE, MAGNETIC RECORDING,  
VIDEO  
TAPE, RECORDING, GRAPHIC  
TOOLS, CRIMPERS

MIRATEL ELECTRONICS, INC.  
DISPLAY EQUIPMENT, TV  
INDUSTRIAL TV  
MONITORS, VIDEO  
TV SYSTEMS, CLOSED CIRCUIT

MOLE-RICHARDSON CO.  
LAMPS, ARC  
LAMPS, GLOW  
LAMPS, PANEL  
LAMPS, PROJECTION  
LIGHTING, TV, COMPONENTS  
LIGHTING, TV, CONTROLS  
LIGHTING, TV, SYSTEMS  
LIGHTNING ARRESTERS  
MICROPHONE STANDS & BOOMS  
RELAYS, TIME DELAY

MOSELEY ASSOCIATES INC.  
ALARM, FAULT  
AMPLIFIER, DC  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
COMMUNICATIONS SYSTEMS,  
MULTIPLEX  
EXCITERS, FM  
GENERATORS, FM, STEREO  
GENERATORS, FM, SUBCARRIER  
MICROWAVE SYSTEMS, STL  
MOBILE EQUIPMENT  
NARROW-BAND FM EQUIPMENT  
REMOTE CONTROL SYSTEMS  
STL EQUIPMENT  
TRANSMITTERS, FM, 10 WATTS

DONALD P. MOSSMAN, INC.  
SWITCHES, ILLUMINATED  
SWITCHES, INTERLOCK  
SWITCHES, LEVER  
SWITCHES, MULTICONTACT  
SWITCHES, PUSHBUTTON,  
NONILLUMINATED  
SWITCHES, TELEPHONE TYPE

MOTOROLA COMMUNICATIONS  
ANTENNAS, MICROWAVE  
ANTENNAS, MOBILE  
BACKGROUND MUSIC SERVICE  
CAMERA, MOUNTING EQUIPMENT  
CAMERA, REMOTE  
CONTROL EQUIPMENT  
CAMERAS, TV, MONOCHROME  
VOLTMETERS, AC  
VOLTMETERS, DC  
WATTMETERS

MOTOROLA SEMICONDUCTOR  
PRODUCTS, INC.  
INTEGRATED CIRCUITS  
MICROWAVE COMPONENTS  
RECTIFIERS - ALSO  
SEE SEMICONDUCTORS  
SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTOR RECTIFIERS,  
POWER  
SEMICONDUCTOR RECTIFIERS,  
SILICON CONTROLLED - SCR  
SEMICONDUCTORS, THYRISTORS  
SEMICONDUCTORS,  
TRANSISTORS, AF  
SEMICONDUCTORS,  
TRANSISTORS, FE  
SEMICONDUCTORS, TRANSISTORS,  
GENERAL  
SEMICONDUCTORS,  
TRANSISTORS, RF

MULTRONICS, INC.  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, RF, POWER  
ANTENNAS, LF  
ANTENNAS, MF  
COILS, ANTENNA LOADING  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
COUPLERS  
INDUCTANCES, FIXED  
INDUCTANCES, VARIABLE  
MONITORS, PHASE  
NETWORKS, PHASING  
SWITCHING MATRIXES

MVR CORPORATION  
RECORDERS, DISC, MAGNETIC  
RECORDERS, MAGNETIC TAPE,  
VIDEO  
TV SYSTEMS, CLOSED CIRCUIT

NARDA MICROWAVE  
ANTENNAS, MICROWAVE  
ANTENNAS, 2500 MHZ

ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
ATTENUATORS, VIDEO  
CALORIMETERS  
CAVITIES, MICROWAVE  
CHOKES, WAVEGUIDE  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, RF  
COUPLERS  
DETECTORS, MICROWAVE  
DETECTORS, STANDING WAVE  
DIVIDERS, POWER  
FILTERS, RF  
GENERATORS, SIGNAL, PULSE  
GENERATORS, SIGNAL, RF  
METERS, FREQUENCY  
METERS, FREQUENCY CALIBRATING  
METERS, POWER  
METERS, STANDING WAVE  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, OTHER  
NETWORKS, MATCHING, RF  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
OSCILLATORS, OTHER  
RECEIVERS, HF  
SHIFTERS, PHASE, MICROWAVE  
SLOTTED SECTIONS  
SWITCHES, COAXIAL  
TRANSMISSION LINES  
TRANSMISSION TEST SETS

NESCO INSTRUMENTS DIVISION  
RECORDERS, PAPER,  
LOGGING AND GRAPHIC

NEUMADE PRODUCTS  
CABINETS, METAL  
CABINETS, STORAGE, DISC  
CABINETS, STORAGE, FILM  
CABINETS, STORAGE,  
MAGNETIC TAPE  
CLEANERS, OTHER  
EDITORS, FILM  
FILM, PHOTOGRAPHIC  
RACKS, MOUNTING  
REELS, FILM  
REWINDERS, FILM  
RHEOSTATS  
SOLVENTS AND CLEANERS  
SPLICERS, MAGNETIC TAPE  
AND FILM

NORTHEAST ELECTRONICS  
ANALYZERS, DISTORTION  
ANALYZERS, NOISE  
GENERATORS, SIGNAL, AF  
METERS, DB AND VU

NORTH AMERICAN PHILIPS COMPANY  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, REVERBERATION  
AMPLIFIER, DISTRIBUTION  
CAMERAS, FILM, CINE  
CAMERAS, FILM, STILL  
CAMERAS, TV, COLOR  
CAMERAS, TV, MONOCHROME  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
EARPHONES, HEADPHONES  
EDUCATION FACILITIES,  
PUBLISHERS  
EDUCATION FACILITIES, EQPT  
ENCLOSURES, SPEAKER  
MICROPHONE HARDWARE  
MICROPHONE STANDS & BOOMS  
MICROPHONES, CONDENSER  
MICROPHONES, DYNAMIC  
MIXERS - ALSO SEE CONSOLES  
PREAMPLIFIERS, AUDIO  
RECEIVERS, AM  
RECEIVERS, FM  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
VIDEO  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, PORTABLE  
SOUND SYSTEMS, THEATER  
SPEAKER COMPONENTS  
SPEAKERS  
VACUUM TUBES, CAMERA,  
PLUMBICON R  
VACUUM TUBES, CAMERA, VIOTICON

NORTONICS COMPANY, INC.  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
TAPE, MAGNETIC RECORDING,  
TEST

THE NOVA CORPORATION  
CAPACITORS, FIXED, FILM  
CAPACITORS, FIXED, METALLIZED  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
MOBILE EQUIPMENT

OAK MANUFACTURING CO.  
CHOPPERS  
SWITCHES, ILLUMINATED  
SWITCHES, INTERLOCK  
SWITCHES, LEVER  
SWITCHES, MECHANICALLY  
ACTUATED  
SWITCHES, MULTICONTACT  
SWITCHES, PUSHBUTTON,  
NONILLUMINATED  
SWITCHES, ROTARY  
SWITCHES, SLIDE  
SWITCHES, SNAP

OKTRON INDUSTRIES  
SPEAKERS

OHMITE MANUFACTURING COMPANY  
ATTENUATORS,  
IMPEDANCE MATCHING  
BOXES, DECADE, RESISTOR  
CAPACITORS, FIXED,  
ELECTROLYTIC  
KNOBS  
POTENTIOMETERS, CARBON  
POTENTIOMETERS, WIREWOUND  
RELAYS, GENERAL PURPOSE  
RELAYS, LATCHING  
RELAYS, LIGHT-INDICATING  
RELAYS, OVERLOAD  
RELAYS, POWER  
RELAYS, TIME DELAY  
RESISTORS, FIXED, CARBON  
RESISTORS, FIXED,  
NONINDUCTIVE  
RESISTORS, FIXED, PRECISION  
RESISTORS, FIXED, WIREWOUND  
RESISTORS, FIXED, OTHER  
RESISTORS, VARIABLE, CARBON  
RESISTORS, VARIABLE,  
WIREWOUND  
RHEOSTATS  
SEMICONDUCTOR DIODES  
SWITCHES, MECHANICALLY  
ACTUATED  
SWITCHES, ROTARY  
TRANSFORMERS, VARIABLE

GUNNAR A. OLSEN CORP.  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

ONAN DIVISION  
CHARGERS, BATTERY  
GENERATORS, POWER,  
GASOLINE ENGINE

ORBIT RADIO  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, REVERBERATION  
AMPLIFIER, AF, STEREO  
AMPLIFIER, BRIDGING  
AMPLIFIER, DISTRIBUTION  
AUTOMATION EQUIPMENT  
BACKGROUND MUSIC SERVICE  
BROADCAST PROGRAMMING SERVICE  
CARRIER-CURRENT EQUIPMENT  
CARTRIDGES, TAPE,  
RECORDING SERVICE  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, AUDIO, AM  
EDITORS, AUDIO TAPE  
FILTERS, AUDIO  
MAINTENANCE SERVICES, AM  
MAINTENANCE SERVICES, FM  
MIXERS - ALSO SEE CONSOLES  
PREAMPLIFIERS, AUDIO  
REMOTE CONTROL SYSTEMS  
REVERBERATION DEVICES  
SOUND SYSTEMS, PORTABLE  
TAPE, MAGNETIC RECORDING,  
TEST

PACIFIC TOWER CO.  
ANTENNAS, TV  
LIGHTING, TV, COMPONENTS  
LIGHTING, TV, SYSTEMS  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV  
WIRE, BARE, COPPER

PAINTON INCORPORATED  
ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
ATTENUATORS, RF  
ATTENUATORS, VIDEO  
CHOKES, WAVEGUIDE  
KNOBS  
POTENTIOMETERS, WIREWOUND  
RESISTORS, FIXED, CARBON  
RESISTORS, FIXED, PRECISION  
RESISTORS, FIXED, WIREWOUND  
RESISTORS, FIXED, OTHER  
RESISTORS, VARIABLE,  
WIREWOUND  
SWITCHES, MULTICONTACT  
SWITCHES, PUSHBUTTON,  
NONILLUMINATED  
SWITCHES, ROTARY  
SWITCHES, TOGGLE

PALL TRINITY MICRO CORP.  
DEHUMIDIFIERS  
DESICCANTS  
FILTERS, OTHER  
WIRING AND CABLING SERVICES

PERMOFLUX CORPORATION  
AMPLIFIER, AF,  
GENERAL PURPOSE

AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, STEREO  
COILS, CHOKE, AF  
EARPHONES, HEADPHONES  
MICROPHONES, DYNAMIC  
PREAMPLIFIERS, AUDIO  
SPEAKER COMPONENTS  
SPEAKERS  
TRANSFORMERS, AUDIO,  
ISOLATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, AUDIO,  
POWER OUTPUT  
TRANSFORMERS, AUTO  
TRANSFORMERS, COUPLING  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
TRANSFORMERS, PLATE  
TRANSFORMERS, POWER

PHELPS DODGE  
CABLE, ARMORED  
CABLE, ASSEMBLIES  
CABLE, CATV, HARDWARE  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
CABLE, DIRECT-BURIAL  
CONNECTORS, ANTENNA  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, RF  
DELAY LINES  
DIPLEXERS  
JACK PANEL ASSEMBLIES  
JACKS  
MICROWAVE COMPONENTS  
PLUGS, COAXIAL  
SLOTTED SECTIONS  
TERMINALS, HIGH VOLTAGE  
TRANSMISSION LINES  
TRANSMISSION TEST SETS  
ASSOCIATED COMPONENTS  
WAVEGUIDE AND

PIEZO CRYSTAL CO.  
CRYSTALS, PIEZOELECTRIC  
FILTERS, OTHER

H K PORTER INC  
HARDWARE, TOOLS  
TOOLS, CRIMPERS  
TOOLS, CUTTERS  
TOOLS, HAND

POWER-OPTICS INCORPORATED  
CAMERA, MOUNTING EQUIPMENT  
CAMERA, REMOTE  
CONTROL EQUIPMENT  
INDUSTRIAL TV  
LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM

POWER SOURCES  
INVERTERS, DC TO AC,  
SOLID STATE  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC

PRECISION LABORATORIES  
CAMERAS, FILM, CINE  
CAMERAS, FILM, STILL  
EDITORS, FILM  
EDITORS, VIDEO TAPE  
HEADS, RECORDING, MAGNETIC  
PROJECTORS, FILM  
PROJECTORS, SLIDE  
SPLICERS, MAGNETIC TAPE  
AND FILM

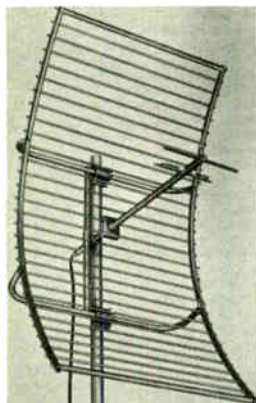
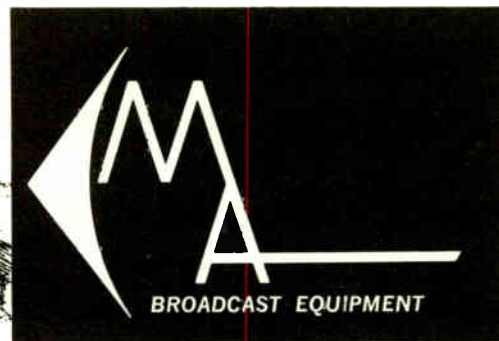
PRECISION PIEZO SERVICE  
CRYSTALS, PIEZOELECTRIC

PRODELIN, INCORPORATED  
ADAPTERS, CONNECTOR  
ANTENNAS, MICROWAVE  
ANTENNAS, MOBILE  
ANTENNAS, 2500 MHZ  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
CABLE, CATV, HARDWARE  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
COILS, ANTENNA LOADING  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
CONNECTORS, ANTENNA  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, RF  
DIPLEXERS  
DIVIDERS, POWER  
DUMMY LOAD  
FILTERS, ANTENNA  
FILTERS, RF  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, STL  
MICROWAVE SYSTEMS, 2500 MHZ  
MOUNTS, ANTENNA, FIXED  
MOUNTS, ANTENNA, MOBILE  
RADOMES  
SHIFTERS, PHASE, MICROWAVE  
SLOTTED SECTIONS  
SWITCHES, COAXIAL

PRO-TEX REEL BAND COMPANY  
LEADER, FILM

PRUZAN COMPANY  
CATV, HARDWARE  
POLE CLIMBING EQUIPMENT  
SAFETY DEVICES, CLIMBING





Scala PR-450 Antenna

## AURAL STUDIO-TRANSMITTER LINKS

FOR FM · AM · TV · INTERCITY RELAY

Six years of continuous operation in broadcast service and 150 units in the field have established the Moseley STL as the accepted industry standard.

**Model PCL-2B** Low distortion, wide frequency response, and exceptionally good transient response. Designed for continuous duty, the PCL-2B is rated at 8 watts maximum output. For FM stereo use DUAL MODEL PCL-2B, a concept pioneered by Moseley Associates, Inc.

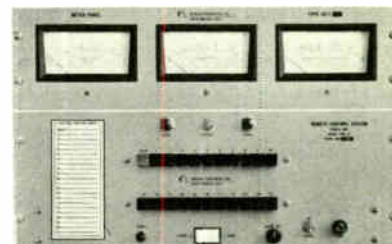
## SOLID-STATE REMOTE CONTROL SYSTEMS

RADIO and WIRE

**Model PBR-21** All transistorized 21 channel deluxe control system can be operated over single wire line or radio circuit. DC line continuity not required. A complete line of control subcarrier generators and detectors is available to adapt the PBR-21 to STL systems for radio control. All FM radio remote control systems compatible with stereophonic and SCA program operation. (Write for Technical Bulletin 213). PBR-21 Studio Control Unit illustrated at right.

**Model WRC-10T** Designed to operate over a SINGLE DC wire pair, this 10 channel all solid-state control system is dependable, accurate, and economical. 4" rectangular meter provided for easy readout.

**Model SCS-1 Status/Control System** Employing plug-in modules, this solid-state 8 channel system can be used as status indicator, fault reporting, or one-way control system. Will operate over single telephone line or narrow band radio channel.



Model PBR-21

## FM TRANSMISSION EQUIPMENT

LPE-10 SCG-3 SCG-4T

The **Model SCG-4T SCA Subcarrier Generator** illustrated is the newest FM product of Moseley Associates. Of all solid-state design, the Model SCG-4T contains a peak reading deviation meter calibrated directly in KHz. Muting circuitry is all electronic (no relays) for maximum reliability.

The **Model LPE-10 direct FM 10 watt Exciter** is FCC Type Accepted for stereo and SCA service as well as an educational transmitter (LPT-10). It is ideal as replacement exciter when updating old style FM transmitters. **Model SCG-3 FM Stereo Generator** connects directly into exciter. Wideband input capability of LPE-10 assures maximum transmission linearity of composite stereo waveform from SCG-3.



Model SCG-4T



Model RPL-1T

## BROADCAST REMOTE PICKUP SYSTEMS

**Model RPL-1** Designed for continuous duty, 30 watt high quality broadcast remote pickup transmitter provides studio sound away from home. Operating in the 148-174 MHz band, the RPL-1 Remote Pickup System has low distortion and wide frequency response, making it an excellent choice for FM stations.

**450 MHz Solid-state Remote Pickup System** Newly designed, this all solid-state system provides the broadcaster with a modern, high quality remote pickup unit for use on any of the 20 channels in Group N. Only JEDEC-registered silicon semiconductors used.

# MOSELEY ASSOCIATES, INC.

135 NOGAL DRIVE, SANTA BARBARA, CALIFORNIA 93105  
TELEPHONE 805-967-0424

**PULSE TECHNIQUES**

EQUALIZERS, AUDIO EMPHASIS

**O R K ELECTRONIC PRODUCTS**

PREAMPLIFIERS, AUDIO  
TURNABLES, PHONOGRAPH

**Q-TV SALES & DISTRIBUTING**

DISPLAY EQUIPMENT, TV

**JULES RACINE CO., INC.**

TIMERS, MANUAL

**RADIO AIDS**

CALIBRATION SERVICE,  
FREQUENCY

**RAVEN SCREEN CORPORATION**

SCREENS, PROJECTION, FRONT  
SCREENS, PROJECTION, REAR

**RAYTHEON CO., EQUIPMENT DIV.**

AMPLIFIER, CLAMPING  
AMPLIFIER, TV, VIDEO  
ANTENNAS, MICROWAVE  
ANTENNAS, 2500 MHZ  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, STL  
MICROWAVE SYSTEMS, 2500 MHZ  
MICROWAVE SYSTEMS, OTHER  
MOUNTS, ANTENNA, FIXED  
MOUNTS, ANTENNA, MOBILE  
RACKS, MOUNTING

**RBM CONTROLS**

RELAYS, GENERAL PURPOSE  
RELAYS, LATCHING  
RELAYS, PLUG-IN  
RELAYS, POWER  
RELAYS, TELEPHONE  
RELAYS, TIME DELAY

**RCA BROADCAST PRODS.**

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, STEREO  
AMPLIFIER, BRIDGING  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, KEYING  
AMPLIFIER, MASKING  
AMPLIFIER, PULSE  
AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, RF, PEAK LIMITING  
AMPLIFIER, RF, POWER  
AMPLIFIER, STABILIZING  
AMPLIFIER, TV, BOOSTER  
AMPLIFIER, TV, VIDEO  
AMPLIFIER, VIDEO, SWEEP  
ANALYZERS, SIDEBAND  
ANTENNAS, AM  
ANTENNAS, FM  
ANTENNAS, MICROWAVE  
ANTENNAS, MOBILE  
ANTENNAS, TV  
ANTENNAS, 2500 MHZ  
ARMS, TONE  
ATTENUATORS, FIXED  
AUTOMATION EQUIPMENT  
BASE STATIONS  
BLOWERS AND FANS  
CABINETS, METAL  
CABINETS, PLASTIC  
CABINETS, STORAGE, FILM  
CABINETS, STORAGE,  
MAGNETIC TAPE  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
CABLE, SHIELDED, AUDIO  
CALORIMETERS  
CAMERA, MOUNTING EQUIPMENT  
CAMERAS, FILM, CINE  
CAMERAS, TV, COLOR  
CAMERAS, TV, MONOCHROME  
CARTRIDGES, MAGNETIC TAPE  
CARTRIDGES, PHONO  
CLOCKS  
COILS, ANTENNA LOADING  
COILS, HYBRID  
COILS, TELEPHONE  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
COMMUNICATIONS SYSTEMS,  
MULTIPLY  
CONNECTORS, AF & MICROPHONE  
CONNECTORS, COAXIAL CABLE  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, CABINETS  
AND HARDWARE  
CONSOLE, VIDEO, STUDIO  
CORDS, PATCH  
COUPLERS  
CRYSTALS, PIEZOELECTRIC  
DELAY LINES  
DEMAGNETIZERS, BULK TAPE  
DEMAGNETIZERS, HEAD  
DEMODULATORS  
DIPLEXERS  
DOLLIES, CAMERA  
DOLLIES, TEST EQUIPMENT  
DROPOUT COMPENSATOR,  
VIDEO TAPE

DUMMY LOAD  
EARPHONES, HEADPHONES  
EDITORS, FILM  
EDITORS, VIDEO TAPE  
ENCLOSURES, SPEAKER  
EQUALIZERS, AUDIO EMPHASIS  
EXCITERS, FM  
FILTERS, AUDIO  
FLASHERS, OTHER  
FLASHERS, TOWER  
GENERATORS, FM, STEREO  
GENERATORS, FM, SUBCARRIER  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, COLD BAR  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL,  
SPECIAL EFFECT  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
INDUSTRIAL TV  
JACK PANEL ASSEMBLIES  
LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
LIGHTING, TV, COMPONENTS  
LIGHTING, TV, CONTROLS  
LIGHTING, TV, SYSTEMS  
METERS, DB AND VU  
METERS, FIELD STRENGTH  
METERS, FREQUENCY  
MICROPHONE HARDWARE  
MICROPHONE STANDS & BOOMS  
MICROPHONES, DYNAMIC  
MICROPHONES, VELOCITY  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, STL  
MICROWAVE SYSTEMS, 2500 MHZ  
MICROWAVE SYSTEMS, OTHER  
MIXERS - ALSO SEE CONSOLES  
MOBILE EQUIPMENT  
MONITORS, AM SYSTEMS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, SCA  
MONITORS, FM SYSTEMS, STEREO  
MONITORS, FREQUENCY  
MONITORS, PHASE  
MONITORS, VIDEO  
MONITORS, WAVEFORM  
MOUNTS, ANTENNA, FIXED  
MOUNTS, ANTENNA, MOBILE  
MULTIPLEXERS  
NETWORKS, PHASING  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
OSCILLOSCOPES  
PLUGS, COAXIAL  
PLUGS, PHONE  
POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO  
PRESSURIZATION EQUIPMENT,  
TRANSMISSION LINE  
PROCESSORS, FILM, B-W  
PROCESSORS, FILM, COLOR  
PROJECTORS, FILM  
PROJECTORS, SLIDE  
RACKS, MOUNTING  
RADAR, WEATHER  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
AUDIO, CARTRIDGE  
RECORDERS, MAGNETIC TAPE,  
VIDEO  
REFLECTORS, PASSIVE  
REWINDERS, FILM  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, PORTABLE  
SOUND SYSTEMS, THEATER  
SPEAKER COMPONENTS  
SPEAKERS  
SPLICERS, MAGNETIC TAPE  
AND FILM  
STL EQUIPMENT  
SWITCHERS  
SWITCHING SYSTEMS  
TAPE DECKS, MAGNETIC  
TAPE, MAGNETIC RECORDING,  
AUDIO  
TAPE, MAGNETIC RECORDING,  
VIDEO  
TERMINAL BLOCKS  
TERMINAL BOARDS  
TERMINAL STRIPS  
TERMINALS, BARRIER  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV  
TRANSFORMERS, AUDIO,  
ISOLATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSMISSION LINES  
TRANSMISSION TEST SETS  
TRANSMITTERS, AM, 1 KW  
TRANSMITTERS, AM, 5 KW  
TRANSMITTERS, AM, 10 KW  
TRANSMITTERS, AM, 25 KW  
TRANSMITTERS, AM, 50 KW  
TRANSMITTERS, FM, 1 KW  
TRANSMITTERS, FM, 5 KW  
TRANSMITTERS, FM, 10 KW  
TRANSMITTERS, FM, 20 KW  
TRANSMITTERS, FM, 40 KW  
TRANSMITTERS, TV, 2 KW  
TRANSMITTERS, TV, 5 KW  
TRANSMITTERS, TV, 6 KW  
TRANSMITTERS, TV, 11 KW  
TRANSMITTERS, TV, 12 KW  
TRANSMITTERS, TV, 25 KW  
TRANSMITTERS, TV, 30 KW  
TRANSMITTERS, TV, 50 KW  
TRANSMITTERS, TV, 150 KW  
TURNABLES, PHONOGRAPH

TV SYSTEMS, CLOSED CIRCUIT  
WATTMETERS  
WAVEGUIDE AND  
ASSOCIATED COMPONENTS  
WIRE, BARE, COPPER  
WIRE, BARE, COPPER STRAP  
WIRE, SHIELDED

**RCA ELECTRONIC COMPONENTS**

BATTERIES, DRY CELL  
CAVITIES, MICROWAVE  
COMMUNICATIONS SYSTEMS, CB  
GENERATORS, FM, STEREO  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, COLOR BAR  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL, MARKER  
GENERATORS, SIGNAL, RF  
INTEGRATED CIRCUITS  
MICROPHONE HARDWARE  
MICROPHONE STANDS & BOOMS  
MICROPHONES, CONDENSER  
MICROPHONES, DYNAMIC  
MICROPHONES, VELOCITY  
DMMETERS  
OSCILLOSCOPES  
PROBES, OSCILLOSCOPE  
PROBES, TEST LEAD  
SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTOR RECTIFIERS,  
POWER  
SEMICONDUCTOR RECTIFIERS,  
SILICON CONTROLLED - SCR  
SEMICONDUCTORS, THYRISTORS  
SEMICONDUCTORS,  
TRANSISTORS, AF  
SEMICONDUCTORS,  
TRANSISTORS, FE  
SEMICONDUCTORS, TRANSISTORS,  
GENERAL  
SEMICONDUCTORS,  
TRANSISTORS, RF  
TESTERS, VACUUM TUBE  
VACUUM TUBES, CAMERA,  
IMAGE-ORTHICON  
VACUUM TUBES, CAMERA, VIDICON  
VACUUM TUBES, CATHODE RAY,  
TV, COLOR  
VACUUM TUBES, CATHODE RAY,  
TV, MONOCHROME  
VACUUM TUBES, RECEIVING  
VACUUM TUBES, TRANSMITTING  
VOLTMETERS, AC  
VOLTMETERS, DC  
VOLTMETERS, VACUUM TUBE

**RCA SERVICE COMPANY**

MAINTENANCE SERVICES, AM  
MAINTENANCE SERVICES, FM  
MAINTENANCE SERVICES,  
MICROWAVE  
MAINTENANCE SERVICES,  
STEREO  
MAINTENANCE SERVICES, TV

**RECORDING EQUIPMENT COMPANY**

AMPLIFIER, AF, MONAURAL  
FILTERS, AUDIO  
FILTERS, RF  
PREAMPLIFIERS, AUDIO

**REEVES SOUNDRAFT**

CARTRIDGES, MAGNETIC TAPE  
RECORDS, BLANK, LACQUER,  
FOR RECORDING  
REELS, TAPE  
TAPE, MAGNETIC RECORDING,  
AUDIO  
TAPE, MAGNETIC RECORDING,  
COMPUTER  
TAPE, MAGNETIC RECORDING,  
VIDEO

**RHG ELECTRONICS LABORATORY**

AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, RF, POWER  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
COMMUNICATIONS SYSTEMS,  
MULTIPLY  
EXCITERS, FM  
MICROWAVE COMPONENTS  
MICROWAVE SYSTEMS, STL  
MICROWAVE SYSTEMS, 2500 MHZ  
MICROWAVE SYSTEMS, OTHER  
RECEIVERS, FM  
RECEIVERS, HF  
STL EQUIPMENT  
TRANSMITTERS, FM, 100 WATTS  
TRANSMITTERS, FM, 1 KW  
TRANSMITTERS, FM, 10 KW

**RIKER VIDEO INDUSTRIES**

AMPLIFIER, DISTRIBUTION  
AMPLIFIER, KEYING  
AMPLIFIER, MASKING  
AMPLIFIER, PULSE  
AMPLIFIER, SENSING  
AMPLIFIER, STABILIZING  
AMPLIFIER, TV, VIDEO  
AUTOMATION EQUIPMENT  
BALUNS  
CLOCKS  
CONSOLE, VIDEO, PORTABLE  
CONSOLE, VIDEO, STUDIO  
DROPOUT COMPENSATOR,  
VIDEO TAPE  
GENERATORS, SIGNAL, COLOR BAR  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL, PULSE

GENERATORS, SIGNAL,  
SPECIAL EFFECT  
GENERATORS, SIGNAL,  
TV, SYNCHRONIZING  
GENERATORS, SIGNAL, VITS  
INDUSTRIAL TV  
OSCILLATORS, TV  
SWITCHERS  
SWITCHING SYSTEMS  
TRANSMISSION TEST SETS  
TV SYSTEMS, CLOSED CIRCUIT

**ROANWELL CORPORATION**

CAPACITORS, VARIABLE  
EARPHONES, HEADPHONES  
TELEPHONE EQUIPMENT

**ROBINS INDUSTRIES CORP**

ACOUSTIC MATERIALS  
ADAPTERS, CONNECTOR  
ANTENNAS, FM  
CABLE, ASSEMBLIES  
CABLE, SHIELDED, AUDIO  
CORDS, PATCH  
DEMAGNETIZERS, BULK TAPE  
DEMAGNETIZERS, HEAD  
EDITORS, AUDIO TAPE  
HARDWARE, GENERAL  
HARDWARE, MOUNTS  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
JACKS  
LAMP ASSEMBLIES  
LOG BOOKS OR SHEETS  
METERS, DB AND VU  
MICROPHONE HARDWARE  
MICROPHONES, DYNAMIC  
PLUGS, COAXIAL  
PROJECTORS, FILM, REAR  
REELS, TAPE  
SLIDES, CHASSIS  
SOLVENTS AND CLEANERS  
SPLICERS, MAGNETIC TAPE  
AND FILM  
STROBE, DISCS  
STROBE, LIGHTS  
SWITCHES, ILLUMINATED  
SWITCHES, SNAP  
SWITCHES, TOGGLE  
TAPE, MAGNETIC RECORDING,  
AUDIO  
WIRE, BARE, COPPER  
WIRE, INSULATED, HOOKUP  
WIRE, SHIELDED

**ROHDE & SCHWARZ SALES CO-USA**

AMPLIFIER, RF, PEAK LIMITING  
AMPLIFIER, VIDEO, SWEEP  
ANALYZERS, DISTORTION  
ANALYZERS, HARMONIC  
ANALYZERS, NOISE  
ANALYZERS, SIDEBAND  
ANALYZERS, VIDEO  
ANTENNAS, MICROWAVE  
ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
ATTENUATORS, VIDEO  
BALUNS  
BRIDGES  
CONNECTORS, ANTENNA  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, POWER  
CONNECTORS, RF  
COUPLERS  
DELAY LINES  
DEMODULATORS  
DETECTORS, MICROWAVE  
DETECTORS, STANDING WAVE  
DIVIDERS, FREQUENCY  
DUMMY LOAD  
FILTERS, AUDIO  
FILTERS, RF  
GENERATORS, FM, STEREO  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, RF  
METERS, FIELD STRENGTH  
METERS, FREQUENCY  
METERS, FREQUENCY CALIBRATING  
METERS, PHASE ANGLE  
METERS, POWER  
METERS, STANDING WAVE  
MICROWAVE COMPONENTS  
MODULATORS, TV  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
OSCILLATORS, AM  
OSCILLATORS, FM  
OSCILLATORS, TV  
OSCILLATORS, OTHER  
RECEIVERS, AM  
RECEIVERS, FM  
RECEIVERS, HF  
RECORDERS, PAPER,  
LOGGING AND GRAPHIC  
SLOTTED SECTIONS  
TESTERS, CAPACITOR  
TESTERS, INSULATION  
TESTERS, SEMICONDUCTOR  
TRANSFORMERS, AUDIO,  
ISOLATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSMITTERS, AM, 5 KW  
TRANSMITTERS, AM, 10 KW  
TRANSMITTERS, FM  
TRANSMITTERS, TV  
VOLTMETERS, AC  
VOLTMETERS, DC  
VOLTMETERS, VACUUM TUBE  
WATTMETERS

ROMN MANUFACTURING COMPANY  
CATV, HEAD-END EQUIPMENT  
HEAD-END EQUIPMENT,  
SEE CATV HEAD-END EQUIPMENT  
LIGHTS, TOWER, OBSTRUCTION  
MOUNTS, ANTENNA, FIXED  
REFLECTORS, PASSIVE  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

RDME CABLE DIV. OF ALCOA  
CABLE, ASSEMBLIES  
CABLE, COAXIAL, FLEXIBLE  
CABLE, DIRECT-BURIAL  
CABLE, SHIELDED, AUDIO  
CABLE, TELEPHONE

ROTRON MANUFACTURING COMPANY  
BLOWERS AND FANS

ROUND HILL ASSOCIATES

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, REVERBERATION  
AMPLIFIER, AF, STEREO  
AMPLIFIER, BRIDGING  
AMPLIFIER, CATV  
AMPLIFIER, DISTRIBUTION  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRELESS

RUSSCO ELECTRONICS MFG.  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, STEREO  
PREAMPLIFIERS, AUDIO  
TURNTABLES, PHONOGRAPH

F. B. RYAN MFG. CO.  
PLOWS, CABLE LAYING

HOWARD W. SAMS & CO. INC.  
EDUCATION FACILITIES,  
PUBLISHERS  
EDUCATION FACILITIES, SCHOOLS

SARKES-TARZIAN  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, TV, VIDEO  
ATTENUATORS, VIDEO  
AUTOMATION EQUIPMENT  
CAMERAS, TV, COLOR  
CAMERAS, TV, MONOCHROME  
CAPACITORS, VARIABLE  
COMMUNICATIONS SYSTEMS,  
MICROWAVE  
COMPUTER EQUIPMENT  
CONSOLE, AUDIO, TV  
CONSOLE, AUDIO, AM  
CONSOLE, VIDEO, PORTABLE  
CONSOLE, VIDEO, STUDIO  
CORDS, PATCH  
DISPLAY EQUIPMENT, TV  
ENHANCERS, TV IMAGE  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
HARDWARE, RACK  
JACK PANEL ASSEMBLIES  
MAINTENANCE SERVICES, TV  
MICROWAVE SYSTEMS, STL  
MONITORS, VIDEO

RECTIFIERS - ALSO SEE SEMI-  
CONDUCTORS & VACUUM TUBES  
RECTIFIERS, SELENIUM  
SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTOR RECTIFIERS,  
POWER  
SEMICONDUCTOR RECTIFIERS,  
SILICON CONTROLLED - SCR  
STL EQUIPMENT  
SWITCHING MATRIXES  
SWITCHING SYSTEMS  
TAPE, MAGNETIC RECORDING,  
AUDIO  
TRANSMITTERS, TV, 1 KW  
TV SYSTEMS, CLOSED CIRCUIT

SAXTON PRODUCTS INC.  
CABLE, ASSEMBLIES  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
CABLE, DIRECT-BURIAL  
CABLE, SHIELDED, AUDIO  
CABLE, TELEPHONE  
WIRE, BARE, COPPER  
WIRE, BARE, COPPER STRAP  
WIRE, BARE, STEEL  
WIRE, INSULATED, HIGH VOLTAGE  
WIRE, INSULATED, HOOKUP  
WIRE, SHIELDED  
WIRING AND CABLING SERVICES

SCALE RADIO CORPORATION  
ANTENNAS, AM  
ANTENNAS, CATV  
ANTENNAS, FM  
ANTENNAS, TV

ANTENNAS, TV,  
MASTER-COMMUNITY  
BALUNS

SCHAFFER ELECTRONICS  
AMPLIFIER, SENSING  
AUTOMATION EQUIPMENT  
BACKGROUND MUSIC SERVICE  
BROADCAST PROGRAMMING SERVICE  
CABINETS, METAL  
PREAMPLIFIERS, AUDIO  
RACKS, MOUNTING  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
LOGGING  
REMOTE CONTROL SYSTEMS  
SWITCHERS  
SWITCHING MATRIXES  
TAPE DECKS, MAGNETIC

ALBERT SCHULTZ, INC.  
BACKGROUND MUSIC SERVICE  
BROADCAST PROGRAMMING SERVICE

SCIENTIFIC-ATLANTA

ANTENNAS, CATV  
ANTENNAS, MICROWAVE  
ANTENNAS, TV,  
MASTER-COMMUNITY  
ANTENNAS, 2500 MHZ  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
ATTENUATORS, VIDEO  
CABINETS, METAL  
CONSOLE, CABINETS  
AND HARDWARE  
DIVIDERS, POWER  
JOINTS, ROTARY, COAXIAL  
MICROWAVE COMPONENTS  
MOUNTS, ANTENNA, FIXED  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
PAPER, CHART AND GRAPH  
RADOMES  
RECEIVERS, HF  
RECORDERS, PAPER,  
LOGGING AND GRAPHIC  
WAVEGUIDE AND  
ASSOCIATED COMPONENTS

H. H. SCOTT, INC.

AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, STEREO  
AMPLIFIER, BRIDGING  
ANALYZERS, NOISE  
GENERATORS, FM, STEREO  
GENERATORS, FM, SUBCARRIER  
GENERATORS, SIGNAL,  
SPECIAL EFFECT, NOISE  
METERS, DB AND VU, WIDE RANGE  
PREAMPLIFIERS, AUDIO  
RECEIVERS, FM  
RECEIVERS, MULTIPLEX

SCULLY RECORDING INSTRUMENTS

AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, STEREO  
AUTOMATION EQUIPMENT  
EDITORS, AUDIO TAPE  
HEADS, DISC RECORDING  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
LATHE, DISC RECORDING  
PREAMPLIFIERS, AUDIO  
RECORDERS, MAGNETIC TAPE,  
AUDIO

SELA ELECTRONICS CO.  
TIMERS, ELECTRIC

SETCHELL CARLSON, INC.  
AMPLIFIER, AF, STEREO  
CABINETS, WOOD  
INDUSTRIAL TV  
MONITORS, VIDEO  
RECEIVERS, AM  
RECEIVERS, FM  
RECEIVERS, TV, COLOR  
RECEIVERS, TV, MONOCHROME  
SPEAKERS  
TV SYSTEMS, CLOSED CIRCUIT

SHURE BROTHERS

ARMS, TONE  
CARTRIDGES, MAGNETIC TAPE  
CARTRIDGES, PHONO  
MICROPHONE HARDWARE  
MICROPHONE STANDS & BOOMS  
MICROPHONES, DYNAMIC  
MIXERS - ALSO SEE CONSOLES  
PREAMPLIFIERS, AUDIO  
STYLUS, PLAYBACK

SIGMA INDUSTRIES

BLOWERS AND FANS  
CABLE, CATV, HARDWARE  
CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
CATV, CABLE TERMINALS  
CONNECTORS, COAXIAL CABLE  
HARDWARE, TUBING, PLASTIC  
PRESSURIZATION EQUIPMENT,  
TRANSMISSION LINE  
TV SYSTEMS, CLOSED CIRCUIT

SIGMA INSTRUMENTS INC.  
RELAYS, GENERAL PURPOSE  
RELAYS, LATCHING  
RELAYS, OVERLOAD  
RELAYS, PHOTOELECTRIC

RELAYS, PLUG-IN  
RELAYS, POWER  
RELAYS, SEQUENCING  
RELAYS, TELEPHONE

THE SINGER CO - METRICS DIV.

AMMETERS, AC  
AMMETERS, AC, THERMOCOUPLE  
AMMETERS, DC  
AMMETERS, RF  
ANALYZERS, DISTORTION  
ANALYZERS, HARMONIC  
ANALYZERS, INTERMODULATION  
ANALYZERS, NOISE  
ANALYZERS, SIDEBAND  
ANALYZERS, VIDEO  
ATTENUATORS, FIXED  
ATTENUATORS, MICROWAVE  
ATTENUATORS, RF  
CAMERAS, OSCILLOSCOPE  
CONVERTERS  
DIVIDERS, VOLTAGE  
DOLLIES, TEST EQUIPMENT  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL, RF  
METER, FIELD STRENGTH  
METERS, FREQUENCY  
METERS, PHASE ANGLE  
METERS, POWER  
METERS - SEE SPECIFIC TYPES  
MONITORS, FREQUENCY  
MONITORS, VIDEO  
MONITORS, WAVEFORM  
POWER SUPPLIES, AC  
SHUNTS, METER  
TURNTABLES, PHONOGRAPH  
VOLTMETERS, AC  
VOLTMETERS, DC  
WATTMETERS

SINGER PRODUCTS CO.

ACOUSTIC MATERIALS  
ADAPTERS, FM STEREO  
ALARM, FAULT  
ALARM, SIGNAL  
AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, REVERBERATION  
AMPLIFIER, BRIDGING  
AMPLIFIER, RF,  
GENERAL PURPOSE  
AMPLIFIER, RF, PEAK LIMITING  
AMPLIFIER, RF, POWER  
ANTENNAS, AM  
ANTENNAS, FM  
ANTENNAS, MICROWAVE  
ANTENNAS, MOBILE  
ANTENNAS, TV  
ARMS, TONE  
ATTENUATORS, RF  
AUTOMATION EQUIPMENT  
BACKGROUND MUSIC SERVICE  
BALUNS  
BASE STATIONS  
BATTERIES, LEAD ACID  
BATTERIES, NICKEL CADMIUM  
BLOWERS AND FANS  
CABINETS, STORAGE,  
MAGNETIC TAPE  
CABLE, ASSEMBLIES  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
CABLE, SHIELDED, AUDIO  
CAPACITORS, FIXED, CERAMIC  
CAPACITORS, FIXED,  
ELECTROLYTIC  
CAPACITORS, FIXED, FILM  
CAPACITORS, FIXED, MICA  
CAPACITORS, FIXED, OIL-FILLED  
CAPACITORS, FIXED, PAPER  
CAPACITORS, VARIABLE  
CARTRIDGES, MAGNETIC TAPE  
CARTRIDGES, PHONO  
CHARGERS, BATTERY  
CIRCUITS, PRINTED  
COILS, DEFLECTION  
AND FOCUSING  
COILS, TELEPHONE  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
COMMUNICATIONS SYSTEMS,  
MULTIPLEX  
COMMUNICATIONS SYSTEMS,  
TELEPRINTER  
CONNECTORS, COAXIAL CABLE  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, CABINETS  
AND HARDWARE  
CORDS, DIAL  
CORDS, PATCH  
CORDS, SET  
CORES, TRANSFORMER AND COIL  
COUPLERS  
DELAY DEVICES, AF  
DEAMAGNETIZERS, BULK TAPE  
EARPHONES, HEADPHONES  
EXCITERS, FM  
FACSIMILE EQUIPMENT  
FUSES  
GENERATORS, FM, STEREO  
GENERATORS, FM, SUBCARRIER  
HARDWARE, TOOLS  
HEADS, DISC RECORDING  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
HOLDERS, FUSE

INVERTERS, DC TO AC,  
SOLID STATE  
JACK PANEL ASSEMBLIES  
JACKS  
KNDSB  
LAMPS, PANEL  
LATHE, DISC RECORDING  
MICROPHONE STANDS & BOOMS  
MICROPHONES, CONDENSER  
MICROPHONES, DYNAMIC  
MICROPHONES, VELOCITY  
MICROPHONES, WIRELESS  
MICROWAVE SYSTEMS, STL  
MIXERS - ALSO SEE CONSOLES  
MOBILE EQUIPMENT  
MONITORS, AM SYSTEMS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, SCA  
MONITORS, FM SYSTEMS, STEREO  
MONITORS, FREQUENCY  
NARROW-BAND FM EQUIPMENT  
NETWORKS, PHASING  
OVENS, CRYSTAL  
PLUGS, COAXIAL  
PLUGS, PHDNE  
POTENTIOMETERS, CARBON  
POTENTIOMETERS, WIREWOUND  
PRINTERS, TELETYPE  
PROJECTORS, FILM  
PROJECTORS, SLIDE  
RECEIVERS, AM  
RECEIVERS, FM  
RECEIVERS, HF  
RECEIVERS, MULTIPLEX  
RECEIVERS, SCA  
RECORDS, BLANK, ACETATE,  
FOR RECORDING  
RECORDS, BLANK, LACQUER,  
FOR RECORDING  
RECTIFIERS, SELENIUM  
REMOTE CONTROL SYSTEMS  
RESISTORS, FIXED, CARBON  
RESISTORS, FIXED, WIREWOUND  
RESISTORS, VARIABLE, CARBON  
REVERBERATION DEVICES  
SCRAMBLERS, SPEECH  
SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTOR RECTIFIERS,  
POWER  
SEMICONDUCTORS,  
TRANSISTORS, AF  
SEMICONDUCTORS, TRANSISTORS,  
GENERAL  
SOLDER  
SOUND SYSTEMS, PORTABLE  
SPEAKER COMPONENTS  
SPEAKERS  
STL EQUIPMENT  
STYLUS, CUTTING  
SWITCHES, COAXIAL  
SWITCHES, ROTARY  
SWITCHES, SLIDE  
SWITCHES, SNAP  
SWITCHES, TOGGLE  
TAPE DECKS, MAGNETIC  
TAPE DUPLICATORS  
TAPE, MAGNETIC RECORDING,  
AUDIO  
TERMINAL BLOCKS  
TERMINAL BOARDS  
TERMINAL STRIPS  
TERMINALS, LUG  
TERMINALS, SOLDER  
TERMINALS, SOLDERLESS  
TESTERS, BATTERY  
TESTERS, INSULATION  
TOOLS, HAND  
TOOLS, PLIERS  
TOOLS, SCREWDRIVERS  
TOOLS, SOLDERING IRONS, GUN  
TOOLS, SOLDERING IRONS,  
INDUSTRIAL  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV  
TRANSFORMERS, AUTO  
TRANSFORMERS, GENERAL  
TRANSMITTER KITS  
TRANSMITTERS, AM, 250 WATT  
TRANSMITTERS, AM, 1 KW  
TRANSMITTERS, AM, 5 KW  
TRANSMITTERS, AM, 10 KW  
TRANSMITTERS, AM, 25 KW  
TRANSMITTERS, AM, 50 KW  
TRANSMITTERS, AM, OVER 50 KW  
TRANSMITTERS, FM, 10 WATTS  
TRANSMITTERS, FM, 100 WATTS  
TRANSMITTERS, FM, 250 WATTS  
TRANSMITTERS, FM, 1 KW  
TRANSMITTERS, FM, 5 KW  
TRANSMITTERS, FM, 20 KW  
TURNTABLES, PHONOGRAPH  
VACUUM TUBES, CATHODE RAY,  
TV, COLOR  
VACUUM TUBES, CATHODE RAY,  
TV, MONOCHROME  
VACUUM TUBES, RECEIVING  
WIRE, INSULATED, HIGH VOLTAGE  
WIRE, SHIELDED  
YOKES, DEFLECTION

SITCO ANTENNA COMPANY

ANTENNAS, CATV  
ANTENNAS, FM  
ANTENNAS, TV,  
MASTER-COMMUNITY  
BALUNS

**SOLA ELECTRIC**

BALLASTS, LAMP  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC  
POWER SUPPLIES, PRECISION  
REGULATORS, CURRENT  
REGULATORS, VOLTAGE  
TRANSFORMERS, AUTO  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
TRANSFORMERS, PLATE  
TRANSFORMERS, POWER

**SOLITRON DEVICES**

CAPACITORS, VARIABLE  
CIRCUITS, PRINTED  
HEAT SINKS  
MICROWAVE COMPONENTS  
RECTIFIERS - ALSO SEE SEMI-  
CONDUCTORS & VACUUM TUBES  
SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTOR RECTIFIERS,  
POWER  
SEMICONDUCTORS,  
TRANSISTORS, AF  
SEMICONDUCTORS, TRANSISTORS,  
GENERAL  
SEMICONDUCTORS,  
TRANSISTORS, RF  
TESTERS, SEMICONDUCTOR

**SONY CORPORATION OF AMERICA**

AMPLIFIER, AF, STEREO  
ARMS, TONE  
CAMERAS, TV, MONOCHROME  
CARTRIDGES, PHONO  
CONSOLE, VIDEO, PORTABLE  
CONSOLE, VIDEO, STUDIO  
HEADS, ERASE, MAGNETIC  
HEADS, RECORDING, MAGNETIC  
INDUSTRIAL TV  
INVERTERS, DC TO AC,  
VIBRATORS  
MICROPHONES, CONDENSER  
MICROPHONES, DYNAMIC  
MICROPHONES, WIRELESS  
MONITORS, VIDEO  
MONITORS, WAVEFORM  
PREAMPLIFIERS, AUDIO  
RECEIVERS, FM  
RECEIVERS, TV, MONOCHROME  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
VIDEO  
REELS, TAPE  
SOUND SYSTEMS, PORTABLE  
SPEAKER COMPONENTS  
SPEAKERS  
TAPE, MAGNETIC RECORDING,  
VIDEO  
TURNTABLES, PHONOGRAPH  
TV SYSTEMS, CLOSED CIRCUIT

**SORENSEN OPERATION**

POWER SUPPLIES, AC  
POWER SUPPLIES, DC

**SOUNDSCRAFT INDUSTRIES**

AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, BRIDGING  
ATTENUATORS, AUDIO  
MIXERS - ALSO SEE CONSOLES  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO

**THE SOUNDSCRIBER CORPORATION**

DEMAGNETIZERS, BULK TAPE  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
LOGGING

**SOUTH SHORE RADIO-TELEPHONE**

COMMUNICATIONS SYSTEMS,  
LAND MOBILE

**SOUTHWESTERN COMMUNICATIONS**

AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, REVERBERATION  
AMPLIFIER, AF, STEREO  
AMPLIFIER, BRIDGING  
ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
BACKGROUND MUSIC SERVICE  
CABLE, ASSEMBLIES  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRELESS  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, AUDIO, AM  
EQUALIZERS, AUDIO EMPHASIS  
JACK PANEL ASSEMBLIES  
LATHE, DISC RECORDING  
MAINTENANCE SERVICES, AM

MAINTENANCE SERVICES, FM  
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MONITORS, FM SYSTEMS, MONO  
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FOR RACK MOUNTING  
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CONSOLE, AUDIO, PORTABLE  
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CONSOLE, AUDIO, TV  
CONSOLE, CABINETS  
AND HARDWARE  
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DEMAGNETIZERS, HEAD  
HEADS, RECORDING, MAGNETIC  
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MICROPHONES, DYNAMIC  
MICROPHONES, WIRELESS  
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TRANSFORMERS, AUDIO,  
POWER OUTPUT  
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CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
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DIVIDERS, POWER  
DUMMY LOAD  
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MAINTENANCE SERVICES, TV  
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OSCILLATORS, TV  
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TRANSMITTERS, FM, 10 KW  
TRANSMITTERS, FM, 20 KW  
TRANSMITTERS, TV, 500 WATTS  
TRANSMITTERS, TV, 5 KW  
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TV SYSTEMS, CLOSED CIRCUIT

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TOWERS, ANTENNA,  
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MOBILE EQUIPMENT  
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MONITORS, WAVEFORM  
MULTIPLEXERS  
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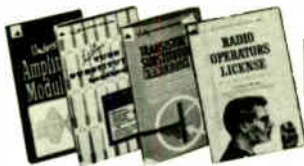
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TRANSISTORS, RF

THE TEXWIP COMPANY

CLEANERS, LENS  
CLEANERS, OTHER

THE THOMAS & BETTS CO.

CLAMPS, CABLE  
CLAMPS, COMPONENT  
CLAMPS, GROUND  
CLAMPS, TUBE  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, POWER  
CONNECTORS, RF  
HARDWARE, TOOLS  
TERMINAL BLOCKS  
TERMINAL BOARDS  
TERMINALS, BARRIER  
TERMINALS, LUG  
TERMINALS, SOLDERLESS  
TOOLS, CRIMPERS  
TOOLS, CUTTERS  
TOOLS, HAND

THOMSON ELECTRIC CO.

ANTENNAS, FM  
ANTENNAS, TV  
CAMERAS, TV, MONOCHROME  
DOLLIES, CAMERA  
JACKS  
TRANSMITTERS, FM  
TRANSMITTERS, TV  
TV SYSTEMS, CLOSED CIRCUIT

THOR ELECTRONICS

SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTOR RECTIFIERS,  
POWER  
SEMICONDUCTOR RECTIFIERS,  
SILICON CONTROLLED - SCR  
SEMICONDUCTORS, THYRISTORS  
SEMICONDUCTORS,  
TRANSISTORS, AF  
SEMICONDUCTORS,  
TRANSISTORS, FE  
SEMICONDUCTORS, TRANSISTORS,  
GENERAL  
SEMICONDUCTORS,  
TRANSISTORS, RF  
VACUUM TUBES, BALLAST  
VACUUM TUBES, CAMERA,  
IMAGE-ORTHICON  
VACUUM TUBES, CAMERA, VIDICON

VACUUM TUBES, CATHODE RAY,  
TV, COLOR

VACUUM TUBES, CATHODE RAY,  
TV, MONOCHROME  
VACUUM TUBES, RECEIVING  
VACUUM TUBES, TRANSMITTING

TIMES WIRE AND CABLE

CABLE, ASSEMBLIES  
CABLE, CATV, HARDWARE  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
CABLE, DIRECT-BURIAL  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, RF

TOPAZ, INCORPORATED

INVERTERS, DC TO AC,  
SOLID STATE

TOWNSEND ASSOCIATES

ATTENUATORS, RF  
CHOPPERS - VERTICAL INTERVAL  
CIRCUITS, PRINTED  
COMMUNICATIONS SYSTEMS,  
MULTIPLX  
EXCITERS, FM  
MAINTENANCE SERVICES, TV  
MODULATORS, TV  
NARROW-BAND FM EQUIPMENT  
POWER SUPPLIES, DC,  
HIGH VOLTAGE  
HIGH VOLTAGE  
TRANSLATOR SYSTEMS  
TRANSMITTERS, TV, 3 KW  
TRANSMITTERS, TV, 15 KW  
TRANSMITTERS, TV, 30 KW  
TRANSMITTERS, TV, 55 KW  
TRANSMITTERS, TV, 100 KW

TRAID CORP.

CAMERA, MOUNTING EQUIPMENT  
CAMERAS, FILM, CINE  
CAMERAS, OSCILLOSCOPE  
GENERATORS, SIGNAL, PULSE  
LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
PROJECTORS, FILM

TRANSCO PRODUCTS, INTL.

RECORDS, BLANK, ACETATE,  
FOR RECORDING  
RECORDS, BLANK, LACQUER,  
FOR RECORDING  
STYLI, CUTTING  
STYLI, PLAYBACK

TREPAC CORPORATION OF AMERICA

ALARM, FAULT  
ALARM, SIGNAL  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, REMOTE  
AUTOMATION EQUIPMENT  
CIRCUITS, PRINTED  
COMMUNICATIONS SYSTEMS,  
TELEPRINTER  
DELAY DEVICES, AF  
FILTERS, AUDIO  
GENERATORS, SIGNAL, AF  
INVERTERS, DC TO AC,  
SOLID STATE  
JACK PANEL ASSEMBLIES  
MONITORS, AM SYSTEMS  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
POWER SUPPLIES, AC  
POWER SUPPLIES, DC  
PREAMPLIFIERS, AUDIO  
PRINTERS, TELETYPE  
RELAYS, PLUG IN  
RELAYS, SEQUENCING  
RELAYS, TIME DELAY  
REMOTE CONTROL SYSTEMS  
SCRAMBLERS, SPEECH  
STL EQUIPMENT  
SWITCHERS  
SWITCHING SYSTEMS

TRIPLETT ELECTRICAL INSTR. CO.

AMMETERS, AC  
AMMETERS, AC, THERMOCOUPLE  
AMMETERS, DC  
AMMETERS, RF  
GENERATORS, SIGNAL, RF  
METERS, DB AND VU  
OHMMETERS  
SHUNTS, METER  
TESTERS, SEMICONDUCTOR  
TESTERS, VACUUM TUBE  
VOLTMETERS, AC  
VOLTMETERS, DC  
VOLTMETERS, VACUUM TUBE  
WATTMETERS

TROMPETER ELECTRONICS

ADAPTERS, CONNECTOR  
ATTENUATORS, AUDIO  
ATTENUATORS, FIXED  
ATTENUATORS,  
IMPEDANCE MATCHING  
ATTENUATORS, RF  
ATTENUATORS, VIDEO  
AUTOMATION EQUIPMENT  
CABLE, ASSEMBLIES  
CONNECTORS, AF & MICROPHONE  
CONNECTORS, ANTENNA  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, RF  
COROS, PATCH  
JACK PANEL ASSEMBLIES  
JACKS  
PLUGS, COAXIAL  
RELAYS, COAXIAL

RELAYS, SEQUENCING  
RELAYS, STEPPING  
SWITCHES, COAXIAL  
SWITCHES, CROSSBAR  
SWITCHING MATRICES  
SWITCHING SYSTEMS

TRUSONIC

ENCLOSURES, SPEAKER  
MICROPHONE HARDWARE  
MICROPHONES, CONDENSER  
MICROPHONES, WIRELESS  
SOUND SYSTEMS, OUTDOOR  
SOUND SYSTEMS, PORTABLE  
SOUND SYSTEMS, THEATER  
SPEAKER COMPONENTS  
SPEAKERS

TRW ELECTRONICS

CAPACITORS, FIXED, AIR  
CAPACITORS, FIXED, CERAMIC  
CAPACITORS, FIXED, FILM  
CAPACITORS, FIXED, METALLIZED  
CAPACITORS, VARIABLE  
CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
COILS, ANTENNA LOADING  
COILS, CHOKE, AF  
COILS, CHOKE, RF  
COILS, DEFLECTION  
AND FOCUSING  
CRYSTALS, PIEZOELECTRIC  
FILTERS, AUDIO  
FILTERS, OTHER  
OVENS, CRYSTAL  
POWER SUPPLIES, PRECISION  
SEMICONDUCTOR DIODES  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTORS, TRANSISTORS,  
GENERAL  
SEMICONDUCTORS,  
TRANSISTORS, RF  
SPEAKERS  
TRANSFORMERS, AUDIO,  
ISOLATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, AUDIO,  
POWER OUTPUT  
TRANSFORMERS, AUTO  
TRANSFORMERS, COUPLING  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
TRANSFORMERS, PLATE  
TRANSFORMERS, POWER  
TRANSFORMERS, TRANSISTOR  
TRANSFORMERS, VARIABLE

TRYLON INCORPORATED

ANTENNAS, AM  
BALUNS  
MAINTENANCE SERVICES,  
STEEPLEJACK  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV  
TRANSMISSION LINES, OPEN WIRE

T T ELECTRONICS

FILTERS, AUDIO  
FILTERS, RF  
FILTERS, OTHER

TURNER MICROPHONE CO.

MICROPHONE HARDWARE  
MICROPHONE STANOS & BOOMS  
MICROPHONES, DYNAMIC

TV CABLE SUPPLY CO.

DIVIDERS, FREQUENCY  
METERS, FIELD STRENGTH  
METERS, FREQUENCY CALIBRATING  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, GENERAL

ULTRA AUDIO PRODUCTS

COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, AUDIO, AM

UNGAR ELECTRIC TOOLS

TOOLS, SOLDERING IRONS,  
INDUSTRIAL

UNITED RADIO SUPPLY, INC.

CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, RECORDING

UNITED STATES PLASTIC ROPE

COROS, DIAL  
INSULATORS, ANTENNA

UNITED STATES TOWERS

TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

UNITED TRANSFORMER COMPANY

BOXES, DECADE, INDUCTOR  
COILS, CHOKE, AF

CDLS, HYBRID  
COILS, TELEPHONE  
DELAY DEVICES, AF  
DELAY LINES  
FILTERS, AUDIO  
FILTERS, OTHER  
INDUCTANCES, FIXED  
INDUCTANCES, VARIABLE  
TRANSFORMERS, AUDIO,  
ISOLATION  
TRANSFORMERS, AUDIO, MATCHING  
TRANSFORMERS, AUDIO,  
POWER OUTPUT  
TRANSFORMERS, AUTO  
TRANSFORMERS, COUPLING  
TRANSFORMERS, FILAMENT  
TRANSFORMERS, GENERAL  
TRANSFORMERS, PLATE  
TRANSFORMERS, POWER  
TRANSFORMERS, TRANSISTOR  
TRANSFORMERS, VARIABLE

UP-RIGHT SCAFFOLDS

CAMERA, MOUNTING EQUIPMENT  
LIGHTNING ARRESTERS  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV

UPSON BROS.

HARDWARE, TOOLS  
KITS  
TOOLS, HAND  
TOOLS, SCREWDRIVERS

UTICA CORP.

ANTENNAS, MOBILE  
BASE STATIONS  
COMMUNICATIONS SYSTEMS, CB  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRELESS  
COMMUNICATIONS SYSTEMS,  
LAND MOBILE  
MOBILE EQUIPMENT  
MONITORS, FM SYSTEMS, MONO  
MOUNTS, ANTENNA, MOBILE  
MOUNTS, INSTRUMENT  
NARROW-BAND FM EQUIPMENT  
PREAMPLIFIERS, AUDIO  
RECEIVERS, AM  
RECEIVERS, FM  
TRANSMITTERS, TV, 60 WATTS

UTILITY PRODUCTS CO.

CATV, CABLE TERMINALS  
TERMINAL BOARDS

UTILITY TOWER CO.

CATV EQUIPMENT - ALSO SEE  
OTHER CATEGORIES  
INSULATORS, TOWER BASE  
MAINTENANCE SERVICES,  
STEEPLEJACK  
PREFABRICATED BUILDINGS  
REFLECTORS, PASSIVE  
TOWERS, ANTENNA,  
CATV, HEAD-END  
TOWERS, ANTENNA, RECEIVING  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV  
WIRE, BARE, COPPER  
WIRE, BARE, COPPER STRAP

VALUE INCORPORATED

DRAFTING EQUIPMENT

VEGA ELECTRONICS CORP.

AMPLIFIER, AF, COMPRESSING  
MICROPHONES, CONDENSER  
MICROPHONES, WIRELESS  
RECEIVERS, FM

VENT-RAK INCORPORATED

CABINETS, METAL  
CONSOLE, CABINETS  
AND HARDWARE  
HARDWARE, CHASSIS  
LAMP ASSEMBLIES  
PANELS, INSTRUMENT,  
FOR RACK MOUNTING  
REELS, CABLE, AUTOMATIC  
SLIDES, CHASSIS

VIDEON CORPORATION

AMPLIFIER, DC  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, TV, VIDEO  
ANALYZERS, VIDEO  
DIVIDERS, FREQUENCY  
GENERATORS, SIGNAL, COLOR BAR  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL, MARKER  
GENERATORS, SIGNAL, PULSE  
GENERATORS, SIGNAL,  
SPECIAL EFFECT  
GENERATORS, SIGNAL,  
SQUARE WAVE  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
GENERATORS, SIGNAL, VITS  
MULTIPLXERS  
OSCILLATORS, TV  
POWER SUPPLIES, DC  
POWER SUPPLIES, PRECISION  
PREAMPLIFIERS, VIDEO

SWITCHERS  
SWITCHING SYSTEMS

VIKING OF MINNEAPOLIS

AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF, STEREO  
CARTRIDGES, MAGNETIC TAPE  
RECORDERS, MAGNETIC TAPE,  
RECORDERS, MAGNETIC TAPE,  
AUOJO  
AUDIO, CARTRIDGE  
RECORDERS, MAGNETIC TAPE,  
TAPE DECKS, MAGNETIC  
TAPE DUPLICATORS

VISHAY RESISTOR PRODUCTS

RESISTORS, FIXEO,  
NONINDUCTIVE  
RESISTORS, FIXEO, PRECISION

VISUAL ELECTRONICS CORP

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, AF, REVERBERATION  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, STABILIZING  
AMPLIFIER, TV, VIDEO  
AMPLIFIER, VIDEO, SWEEP  
ANTENNAS, AM  
ANTENNAS, FM  
ANTENNAS, MICROWAVE  
ANTENNAS, TV  
AUTOMATION EQUIPMENT  
CABLE, COAXIAL, FLEXIBLE  
CABLE, COAXIAL, RIGID  
CAMERA, MOUNTING EQUIPMENT  
CAMERA, REMOTE  
CONTROL EQUIPMENT  
CAMERAS, FILM, CINE  
CAMERAS, TV, COLOR  
CAMERAS, TV, MONOCHROME  
CARTRIDGES, MAGNETIC TAPE  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIREO  
CONNECTORS, COAXIAL CABLE  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, VIDEO, STUDIO  
OIPLEXERS  
DOLLIES, CAMERA  
DROPOUT COMPENSATOR,  
VIDEO TAPE  
EDITORS, VIDEO TAPE  
EXCITERS, FM  
GENERATORS, SIGNAL, COLOR BAR  
GENERATORS, SIGNAL, DOT BAR  
GENERATORS, SIGNAL, MARKER  
GENERATORS, SIGNAL, PULSE  
GENERATORS, SIGNAL, SPECIAL EFFECT  
GENERATORS, SIGNAL,  
SQUARE WAVE  
GENERATORS, SIGNAL,  
TV SYNCHRONIZING  
GENERATORS, SIGNAL, VITS  
JACK PANEL ASSEMBLIES  
JACKS  
LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
LIGHTING, TV, COMPONENTS  
LIGHTING, TV, CONTROLS  
LIGHTING, TV, SYSTEMS  
MICROPHONE HARDWARE  
MICROPHONE STANDS & BOOMS  
MICROPHONES, CONDENSER  
MICROPHONES, DYNAMIC  
MICROPHONES, VELOCITY

MICROPHONES, WIRELESS  
MICROWAVE SYSTEMS, STL  
MONITORS, AM SYSTEMS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, FM SYSTEMS, SCA  
MONITORS, FM SYSTEMS, STEREO  
MONITORS, FREQUENCY  
MONITORS, PHASE  
MONITORS, VIDEO  
MONITORS, WAVEFORM  
PROJECTORS, FILM  
PROJECTORS, SLIDE  
RECORDERS, MAGNETIC TAPE,  
AUDIO  
RECORDERS, MAGNETIC TAPE,  
VIDEO  
RELAYS, COAXIAL  
REMOTE CONTROL SYSTEMS  
REVERBERATION DEVICES  
SCREENS, PROJECTION, FRONT  
SCREENS, PROJECTION, REAR  
STL EQUIPMENT  
SWITCHERS  
SWITCHING SYSTEMS  
TAPE DECKS, MAGNETIC  
TAPE DUPLICATORS  
TOWERS, ANTENNA,  
TRANSMITTING, AM  
TOWERS, ANTENNA,  
TRANSMITTING, FM  
TOWERS, ANTENNA,  
TRANSMITTING, TV  
TRANSMISSION LINES  
TRANSMISSION TEST SETS  
TRANSMITTERS, AM, 1 KW  
TRANSMITTERS, AM, 5 KW  
TRANSMITTERS, AM, 10 KW  
TRANSMITTERS, AM, 25 KW  
TRANSMITTERS, AM, 50 KW  
TRANSMITTERS, FM, 3 KW  
TRANSMITTERS, FM, 5 KW  
TRANSMITTERS, FM, 10 KW  
TRANSMITTERS, FM, 20 KW  
TRANSMITTERS, TV, 15 KW  
TRANSMITTERS, TV, 30 KW  
TRANSMITTERS, TV, 55 KW  
TURNTABLES, PHONOGRAPH  
VACUUM TUBES, CAMERA,  
IMAGE-ORTHICON  
VACUUM TUBES, CAMERA,  
PLUMBICON R  
VACUUM TUBES, CAMERA, VIDICON  
VESTIGIAL SIOEBAND FILTERS

VITAL INDUSTRIES

AMPLIFIER, DISTRIBUTION  
AMPLIFIER, STABILIZING  
AMPLIFIER, TV, VIDEO  
SWITCHING SYSTEMS

VITRO ELECTRONICS

CIRCUITS, PRINTED  
CONNECTORS, COAXIAL CABLE  
CONNECTORS, RF  
CORDS, PATCH  
HARDWARE, PANEL  
HARDWARE, RACK  
INTEGRATEO CIRCUITS  
JACK PANEL ASSEMBLIES  
JACKS  
METERS, FIELD STRENGTH  
MONITORS, AM SYSTEMS  
MONITORS, FM SYSTEMS, MONO  
MONITORS, PHASE  
RECEIVERS, AM  
RECEIVERS, FM  
RECEIVERS, HF  
RECEIVERS, MULTIPLEX  
TERMINAL STRIPS  
WIRING AND CABLING SERVICES

VUE-TRONICS INC.

RECORDERS, VIDEO,  
FILM, KINESCOPE

WABER ELECTRONICS INC.

CABINETS, METAL  
CONNECTORS, POWER  
CORDS, SET

COUPLERS  
DOLLIES, CAMERA  
DOLLIES, TEST EQUIPMENT  
DUCTS, WIRING  
KITS

RACKS, MOUNTING  
SWITCHES, MECHANICALLY  
ACTUATED  
VOLTMETERS, AC

WALLACH & ASSOCIATES

CABINETS, STORAGE, OISC  
CABINETS, STORAGE, FILM  
CABINETS, STORAGE,  
MAGNETIC TAPE  
CABINETS, STORAGE, SLIDE

WARD ELECTRONIC INDUSTRIES

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, COMPRESSING  
AMPLIFIER, AF,  
GENERAL PURPOSE  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF, REMOTE  
AMPLIFIER, BRIDGING  
AMPLIFIER, DISTRIBUTION  
AMPLIFIER, PULSE  
AMPLIFIER, SENSING  
AMPLIFIER, STABILIZING  
AMPLIFIER, TV, VIDEO  
ANALYZERS, SIDEBAND  
AUTOMATION EQUIPMENT  
COMMUNICATIONS SYSTEMS,  
INTERCOM, WIRED  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, PORTABLE  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
CONSOLE, AUDIO, AM  
CONSOLE, VIDEO, PORTABLE  
CONSOLE, VIDEO, STUDIO  
DEMODULATORS  
NETWORKS, PHASING  
PREAMPLIFIERS, AUDIO  
PREAMPLIFIERS, VIDEO  
SWITCHERS  
SWITCHING MATRICES  
SWITCHING SYSTEMS

WATERS MANUFACTURING

ANTENNAS, MOBILE  
ATTENUATORS, RF  
DUMMY LOAD  
FILTERS, OTHER  
METERS, FREQUENCY  
MOUNTS, ANTENNA, MOBILE  
POTENTIOMETERS, WIREWOUND  
RESISTORS, VARIABLE,  
WIREWOUND  
SWITCHES, COAXIAL  
WATTMETERS

WAVEFORMS, INCORPORATED

ANALYZERS, DISTORTION  
GENERATORS, SIGNAL, AF  
GENERATORS, SIGNAL,  
SQUARE WAVE  
METERS, FREQUENCY  
OSCILLATORS, AF AND RF,  
SEE GENERATORS  
OSCILLATORS, OTHER  
TRANSMISSION TEST SETS  
VOLTMETERS, AC  
VOLTMETERS, VACUUM TUBE

WECKESSER COMPANY

CABLE, ASSEMBLIES  
CLAMPS, CABLE

WESTINGHOUSE ELECTRIC CORP.

VACUUM TUBES, CAMERA,  
IMAGE-ORTHICON  
VACUUM TUBES, CAMERA, VIOICON  
VACUUM TUBES, CATHODE RAY,  
TV, COLOR  
VACUUM TUBES, CATHODE RAY,  
TV, MONOCHROME  
VACUUM TUBES, RECEIVING  
VACUUM TUBES, TRANSMITTING

WIDE RESPONSE

REELS, TAPE  
TAPE, MAGNETIC RECORDING,  
AUDIO

WILKINSON ELECTRONICS, INC

AMPLIFIER, AF, AGC  
AMPLIFIER, AF, MONAURAL  
AMPLIFIER, AF,  
PEAK LIMITING, AM  
AMPLIFIER, AF,  
PEAK LIMITING, FM  
CONSOLE, AUDIO, AM  
CONSOLE, AUDIO, FM  
CONSOLE, AUDIO, RECORDING  
CONSOLE, AUDIO, TV  
EXCITERS, FM  
GENERATORS, FM, STEREO  
GENERATORS, FM, SUBCARRIER  
GENERATORS, SIGNAL, RF  
METERS, FIELD STRENGTH  
MONITORS, AM SYSTEMS  
MONITORS, FREQUENCY  
RECTIFIERS - ALSO SEE  
SEMICONDUCTORS  
SEMICONDUCTOR RECTIFIERS,  
GENERAL  
SEMICONDUCTOR RECTIFIERS,  
HIGH VOLTAGE  
SEMICONDUCTOR RECTIFIERS,  
POWER  
TRANSMITTERS, AM, 1 KW  
TRANSMITTERS, AM, 5 KW  
TRANSMITTERS, AM, 10 KW  
TRANSMITTERS, FM, 1 KW  
TRANSMITTERS, FM, 5 KW  
TRANSMITTERS, FM, 7.5 KW  
TRANSMITTERS, FM, 10 KW  
TRANSMITTERS, FM, 20 KW

W. WILSON CORPORATION

HARWARE, MOUNTS  
LAMPS, PROJECTION  
MOBILE EQUIPMENT  
SCREENS, PROJECTION, REAR

XCELITE INCORPORATED

HARWARE, TOOLS  
TOOLS, CUTTERS  
TOOLS, HAND  
TOOLS, PLIERS  
TOOLS, SCREWDRIVERS  
TOOLS, WRENCHES

YOKOGAWA ELECTRIC WORKS

AMMETERS, AC  
AMMETERS, AC, THERMOCOUPLE  
AMMETERS, DC  
AMMETERS, RF  
BRIDGES  
METERS, DB AND VU  
METERS, DB AND VU, WIDE RANGE  
METERS, FIELD STRENGTH  
METERS, FREQUENCY  
METERS, LIGHT  
METERS, PHASE ANGLE  
METERS, POWER  
OHMMETERS  
PANELS, INSTRUMENT,  
FOR RACK MOUNTING  
RECORDERS, PAPER,  
LOGGING AND GRAPHIC  
TESTERS, INSULATION  
VOLTMETERS, AC  
VOLTMETERS, DC  
WATTMETERS

ZOLOMATIC CORPORATION

LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
PROJECTORS, SLIDE

ZOOMAR, INC.

LENSES, OPTICAL, FIXED  
LENSES, OPTICAL, ZOOM  
METERS, LIGHT

# Here's one way to kill a Teltron tube



Teltron image orthicons have long life characteristics. You'll grow old trying to wear them out. These tubes offer performance features surpassing the finest image orthicon's manufactured (monochrome or color applications) at a savings of 35% to 65% (computed on average hourly cost basis). Teltron tubes are guaranteed as long or longer than any competitors product, (for just about everything but smashing them with a hammer). Join the list of satisfied Teltron users. You'll agree that Teltron is the "Answer to a need".

## Teltron tubes are die-hards.



**teltron**  
INCORPORATED

7 BALA AVENUE, BALA CYNWYD, PA. 19004 Telephone 215-664-6672



# When leading broadcast engineers insist on genuine EEV camera tubes, they must have good reasons.

## They do. Plenty of them, in fact.

Television broadcasters the world over have come to rely almost exclusively on the unique combination of tube quality and long-life economy that only English Electric Valve — the world's foremost camera tube manufacturer — can provide.

Typical of this foremost camera tube line are . . .

### ELCON-Target Image Orthicons

- Long life — 3 to 4 times longer
- Stable, non-stick target
- Uniform sensitivity and gamma throughout extended tube life
- No burn-in



#### ELCON Color-Matched Tubes

Matched color sets of ELCON Image Orthicon tubes are selected on the basis of camera control operating parameters, as well as tube sensitivities and signal current outputs. And, in most cases, the need for trimming with neutral density filters is completely eliminated . . . orbiting is not required . . . and sensitivity is improved.

| Type            | Description                                     |
|-----------------|---|
| 4415E/<br>4416E | 3" tube—field mesh; matched set of three tubes. |



#### ELCON 3" Image Orthicon

Non-field mesh and field mesh tubes with effective operational life of 3,000 to 5,000 hours. Full target warranty of 1,200 hours.

| Type    | Description   |
|---------|---|
| 5820A/E | 3" tube—non-field mesh                                |
| 7293B   | 3" tube—field mesh                                    |
| 8093A/E | 3" tube—field mesh; with close target-to-mesh spacing |



#### ELCON 4 1/2" Image Orthicon

ELCON Target — JEDEC-designated; 3,000-5,000/hour operational life; 1,200/hour target warranty.

| Type  | Description  |
|-------|--|
| 7295C | 4 1/2" tube — field mesh.                                    |
| 7389C | 4 1/2" tube — field mesh; with close mesh-to-target spacing. |

### 1-inch Vidicons



#### 1-inch Vidicons, Integral Mesh

| Type  | Description   |
|-------|---|
| P860  | Utilizes new photosurface (similar to 8625, 8626) for high sensitivity, minimum lag; film or studio applications; monochrome or color |
| 7038  | Monochrome or color film camera applications; 600 ma filament   |
| 7735A | For studio and remote cameras; high sensitivity; 600 ma filament  |

#### 1-inch Vidicons, Separate Mesh

- Highest quality pictures with minimal shading
- Low lag; reduced long-term sticking.
- Lower light level operation
- Photo-surface of 8625 and 8626 vidicons combine high "blue" sensitivity and reduced "red" sensitivity for correct panchromatic response to standard tungsten lighting
- Resolution exceeds 1,000 lines
- Beam landing errors minimized for improved signal output

| Type | Description  |
|------|--|
| 8625 | High sensitivity photosurface; preferred spectral response of 7038 type; 600 ma filament |
| 8626 | Equivalent to 8625, with 95 ma filament for transistorized cameras                       |
| 8507 | Low lag, high sensitivity characteristics; 600 ma filament                               |
| 8541 | Equivalent to 8507, with 95 ma filament for transistorized cameras                       |
| 8572 | Low lag characteristics for film application, monochrome or color; 600 ma filament       |



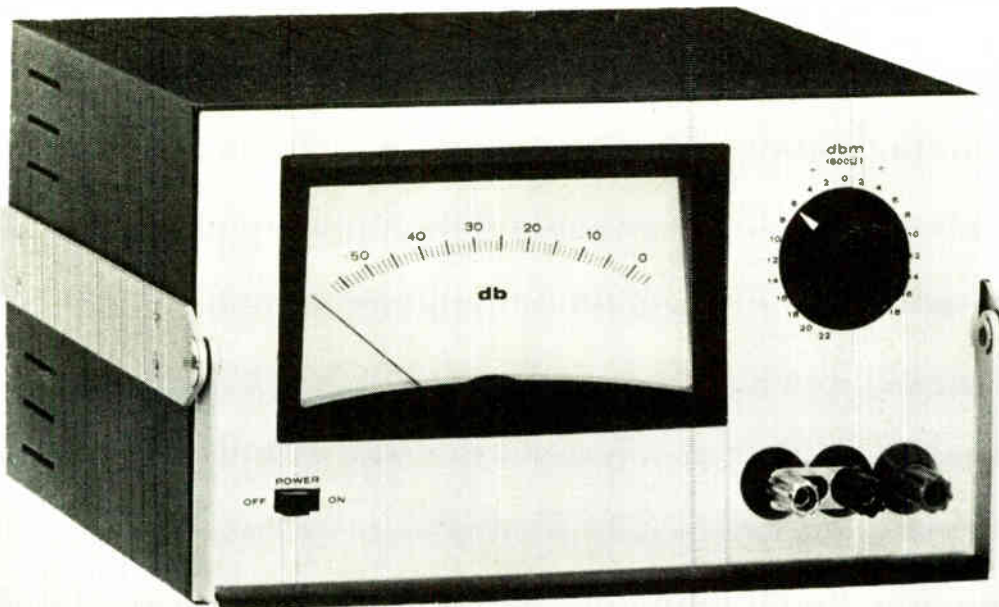
Other tubes available for specific applications. World-wide patents applied for.

For complete information and prices on the Blue Ribbon quality EEV camera tube line, contact

### VISUAL ELECTRONICS CORPORATION

356 west 40th street • new york, n.y. 10018 • (212) 736-5840

FIRST BY ANY STANDARD



## A new way to keep your signal clean.

CBS Laboratories presents its new Model 600 Wide Range Program Monitor.

This remarkable instrument can't censor "blue" comics, but it can keep you from transmitting cross-talk, studio noise and other sounds that may clutter your signal.

In fact, it's the first monitor to combine the latest developments in audio technology with the reliability of solid-state design for accurate audio measurement and analysis on a single 60 dB-wide scale.

Where the standard Volume Indicator measures only the top 23 dB of signal level logarithmically, this new Program Monitor displays information from +3 to -57 dB on a single linear, decibel scale, thus permitting accurate reading of low level audio material as well as line noise during program pauses. The 0 dB reference settings are adjustable from +18 to -22 dBm.

The 600 is also equipped with a separate DC output for graphic logging over the full 60 dB range or to drive a second meter for remote monitoring. It is also available in a standard 19-inch mounting rack from which it can be easily removed for portable use.

While not intended as a replacement for the standard Volume Indicator, the 600's meter ballistics are such that its readings are compatible with VU indications. It's a practical studio monitor as well as a valuable measuring tool.

### SPECIFICATIONS:

Model 600 Wide Range Program Monitor, \$345. As shown above, without standard 19-inch mounting enclosure, \$305.

|                               |   |
|-------------------------------|---|
| Reference Deflection (0 dB)   | Adjustable from +18 to -22 dBm  |
| Internal Noise Level          | At least 15 dB below the -57 dB reading   |
| Total Measurable Range        | -79 to +21 dBm  |
| Scale                         | Linear 60 dB-wide scale from -57 to +3 dB   |
| DC Output                     | Linear volts dB output is 6 volts maximum at 5500 ohms impedance. Calibrated to provide remote monitoring |
| Frequency Range               | 50 to 15,000 cps  |
| Linearity                     | ± 1 dB  |
| Input Impedance               | 15,000 ohms, bridging, balanced or unbalanced   |
| Maximum Operating Temperature | 55° C   |
| Dimensions                    | In enclosure: 19" wide, 7" high, 10" deep<br>Out of enclosure: 9" wide, 5" high, 10" deep                 |
| Power Requirements            | 12 watts, 115/230 volts AC  |
| Shipping Weight               | With enclosure: 14 lbs.<br>Without enclosure: 9 lbs.  |

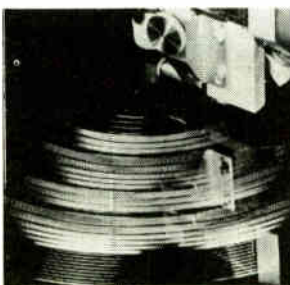
## Technical series Professional Test records

Unique, high-precision tools designed to help audio and quality control engineers and test and service technicians to evaluate audio components, equipment and systems.

Each record has a complete series of tests. These eliminate the need for certain equipment, save hours of time, and make the record a productive tool in the laboratory, on the production line, and in field testing.

### BTR 150 BROADCAST TEST RECORD

Developed especially to meet needs of broadcast engineers seeking a convenient signal source for testing and adjusting all audio equipment. It contains Volume Indicator ballistic calibration signals and is an essential tool for measuring phonographic pickup response. In providing complex waveforms for special tests, it replaces elaborate instrumentation generally unavailable in broadcast stations. Can be used to advantage by all AM, FM, TV and FM-Stereo broadcasters. BTR 150, Net Ea. \$10.00



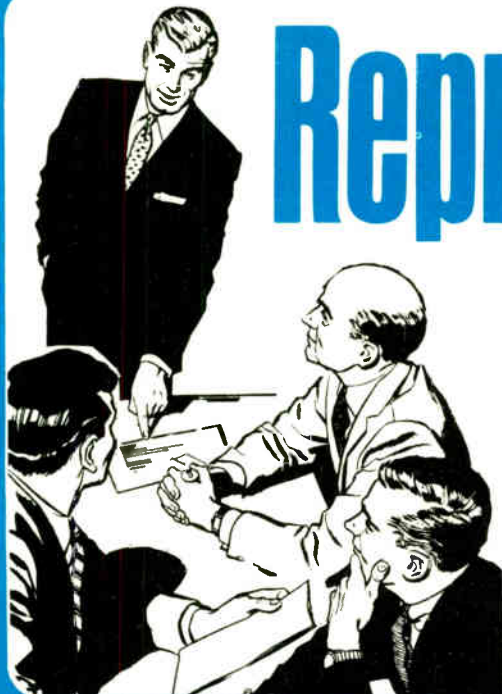
### STR 130 RIAA FREQUENCY RESPONSE TEST RECORD

Designed for calibration of professional recording equipment and for testing response of professional and consumer record reproduction equipment. Rapid, accurate procedures replace lengthy and tedious adjustments. Time for production testing and quality control is reduced to a fraction of time required with conventional methods. Suitable for use with automatic curve tracer to provide permanent, visible records for precise evaluation. Instruction for use without automatic curve tracing included. STR 130, Net Ea. \$10.00

### STR 100 STEREOPHONIC FREQUENCY TEST RECORD

Designed for evaluation of pickups and systems, it was recorded with a constant amplitude characteristic below 500 cps and a constant velocity characteristic above 500 cps. Tests include: Sweep Frequency (with the sweep rate synchronized with the General Radio Type 1521 A Recorder); Spot Frequency (with voice announcements); Channel Separation; Wavelength Loss and Stylus Wear (to pinpoint oversize or worn-out styli, and excessive pickup tracking force); Compliance; Phasing; Vertical and Lateral Tracking Tone Arm Resonance (to check system performance at low and sub-audible frequencies and thus reveal undamped resonances which may cause equipment over-loading). STR 100, Net Ea. \$8.50

**CBS LABORATORIES**  
Stamford, Connecticut. A Division of  
Columbia Broadcasting System, Inc.



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This listing is arranged alphabetically by manufacturer and contains the company name, address, telephone number, and TWX number; sales manager or other executives; brand names; and company representatives arranged alphabetically by states and countries.

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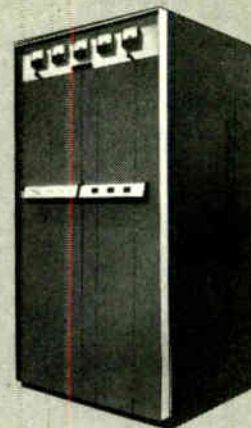
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3376 PEACHTREE RD  
N E ATLANTA, GA  
404 231 3480  
TWX 404 231-1637

L HASE  
CHICAGO REG MGR  
10 KING ST  
ELK GROVE VILLAGE, ILL 60007  
312 439 4600  
TWX 910 222-2864

N. SCHMIDT  
BOSTON REG. MGR.  
235 BEAR HILL RD.  
WALTHAM, MASS. 02154  
617 899-2040  
TWX 710 324-0364

E WENDT  
MINNEAPOLIS REG MGR  
4010 W 65TH ST  
MINNEAPOLIS, MINN 55424  
612 WA 7 5638  
TWX 910 576-2806

WILLIAM SLOVER  
EASTERN AREA MKTG MGR  
75 COMMERCE WAY  
WACKESACK, N J 07661  
201 489 7400  
TWX 201 488-6715

R SIRINSKY  
NEW YORK REG MGR  
75 COMMERCE WAY  
WACKESACK, N J 07661  
201 489 7400  
TWX 201 488-6715

R BEENE  
ALBUQUERQUE REG MGR  
414 SAN MATEO BLVD. NE  
ALBUQUERQUE, N.M. 35801  
505 265 8507  
TWX 910 989-1639

D CRESWELL  
DAYTON REG MGR  
333 W 51 ST, SUITE 338  
DAYTON, OHIO 45402  
513 BA B 5117  
TWX 810 459-1714

G SULLIVAN  
PHILADELPHIA REG MGR  
947 YDRK ROAD  
ABINGTON, PA 19001  
215 TU 7 7650

TWX 215 884-2822

W HEYWOOD  
DALLAS REG MGR  
2626 W MOCKINGBIRD LANE  
SUITE 290  
DALLAS, TEXAS 75235  
214 FL 7 0481  
TWX 214 899-9001

DISTRICT OFFICE  
6001 GULF FREEWAY, ST C-134  
HOUSTON, TEXAS 77023  
713 WA 8 3741  
TWX 713 571-1494

W CRAIG  
WASHINGTON, D C REG MGR  
3620 S 27TH ST  
ARLINGTON, VA 22206  
703 671 4000  
TWX 710 955-9832

J HOPKINS  
SEATTLE REG MGR  
8434 RAINIER AVE  
S SEATTLE, WASH 98118  
206 PA 3 3170  
TWX 206 998-9014

**AMPHENDL DISTRIBUTOR DIVISION**  
SALES MANAGER  
W. T. ADAMS  
COMPANY ADDRESS  
2875 SOUTH 25TH AVE.  
BROADVIEW, ILL. 60153  
COMPANY REPRESENTATIVES  
DDN DE BASID  
401 EAST INDIAN SCHOOL ROAD  
SUITE 209  
PHOENIX, ARIZONA  
602-264-9397-98

RICHARD COLT  
17000 VENTURA, SUITE 306  
ENCINO, CALIF.  
213-788-8560

JAMES V. CLARIZIO  
DISTRICT SALES OFFICE  
1826 INDUSTRIAL WAY, SUITE 8  
REDWOOD CITY, CALIF.  
415-369-2981

RALPH NOFFKE  
DISTRICT SALES OFFICE  
709 W. LITTLETON BLVD.,  
SUITE 200A  
LITTLETON, COLO.  
303-794-6269

EDMUND LEHMANN  
DISTRICT SALES OFFICE  
7600 GEORGIA AVENUE, N.W.  
WASHINGTON, O.C.  
202-829-9000

CHARLES W. KUCCERA  
DISTRICT SALES OFFICE  
601 N. NEW YORK AVENUE,  
SUITE 5  
WINTER PARK, FLORIDA  
305-647-5504

DISTRICT SALES OFFICE  
3224 PEACHTREE RD., N.E.  
ATLANTA, GEORGIA  
404-233-1569

EARL ASSOCIATES  
P.O. BOX 2845, 1638 KONA ST.  
HONOLULU, HAWAII  
808-996-953

JOHN N. KOYS  
2801 S. 25TH AVENUE  
BROADVIEW, ILLINOIS  
312-261-2000

LESLIE M. DEVDE CO.  
4010 WASHINGTON BLVD.  
INDIANAPOLIS, INDIANA  
317-283-1395

RICHARD PURINTON, INC.  
11 MUZZEY STREET  
LEXINGTON, MA, MASS.  
617-862-8300

ALLEN P. NEMETZ  
DISTRICT SALES OFFICE  
960 E. MAPLE RD., SUITE 116  
BIRMINGHAM, MICHIGAN  
313-646-1262

ROGER JENNE  
7701 NORMANDALE ROAD  
MINNEAPOLIS, MINN.  
612-927-6589

JOSEPH B. SVEMLA  
DISTRICT SALES OFFICE  
47 VILLAGE SQUARE  
HAZELWOOD, MO  
314-838-6996

ROBERT MEADE  
DISTRICT SALES OFFICE  
6525 S. CRESCENT BLVD.  
SUITE 212  
PENNSAUKEN, N. J.  
609-665-2870

RICHARD J. PARISSIDI  
DISTRICT SALES OFFICE  
2 LAGRANGE AVENUE  
POUGHKEEPSIE, N. Y.  
914-452-4220

STEPHEN R. KELLEHER  
DISTRICT SALES OFFICE  
310 NORTHERN BLVD.  
GREAT NECK, L. I., N. Y.  
516-482-4700

EDWARD B. SMITH  
DISTRICT SALES OFFICE  
6443 RIDINGS ROAD  
SYRACUSE, N.Y.  
315-437-2689

JOHN J. CARSELLLO  
DISTRICT SALES OFFICE  
20545 CENTER RIDGE ROAD  
SUITE 242  
CLEVELAND, OHIO  
216-331-9100

JOHN E. JANSEN

DISTRICT SALES OFFICE  
811 S. CENTRAL EXPRESSWAY,  
SUITE 295  
RICHARDSON, TEXAS  
214-235-8318  
DONALD C. PERCELL  
DISTRICT SALES OFFICE  
14444 SUNSET HIGHWAY & CO  
P O BOX 726  
BELLEVUE, WASHINGTON  
206 746-5363  
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OAI ICHI DENSHI KOGYO, KK#20,  
3 CHOME, YODOSHI, SHIBUYA-KU  
TOKYO, JAPAN  
UMD - USINE METALLURGIQUE  
DOLOISE, S.A.  
17 AVENUE NIEL 75  
PARIS, FRANCE  
UMD - USINE METALLURGIQUE  
DOLOISE, S.A.  
92 A98 AVENUE DE GRAY 39  
OOLE, FRANCE  
AMPHENOL-BORG ELECTRONICSGMBH  
8024 DEISENHOFEN  
BEI MUNICH, W. GERMANY  
AMPHENOL LIMITED, THANET WAY  
WHITSTABLE, KENT, ENGLAND  
AMPHENOL CANADA LIMITED  
44 METROPOLITAN ROAD  
SCARBOROUGH, ONT.  
AMPHENOL CANADA LIMITED  
42 AYLNER AVENUE  
OTTAWA, ONTARIO  
AMPHENOL CANADA LIMITED  
3285 CAVENISH BLVD. RM 160  
MONTREAL, QUEBEC  
AMPHENOL, S.A. DE C.V.  
CALLE DE PUENTE NO. 6  
MEXICO 22, O.F., MEXICO

AMPLIFIER CORP OF AMERICA

SALES MANAGER  
A. J. GILLETTE  
BRAND NAMES  
MAGNERASE  
MAGNERASER JR  
MAGNETIC PROJECTOR  
COMPANY ADDRESS  
75 FROST STREET  
WESTBURY, L. I., N. Y. 11590  
SALES REPRESENTATIVES  
ARTRONICS  
650 CLEVELAND, AVE  
RIVER VALE, N. J.

AMPLIVISION CORPORATION

SALES MANAGER  
GEORGE BROWNSTEIN  
BRAND NAMES  
AMPLI-VISION  
BENCO  
GILBER  
SONY  
COMPANY ADDRESS  
2000 STONER  
LOS ANGELES, CALIF. 90025  
GR 8-7751  
COMPANY REPRESENTATIVES  
WM LASKY  
2000 STONER  
LOS ANGELES, CALIF. 90025  
GR 8-7751  
LEANORO COMEN  
C/O AMPLIVISION  
PARAMOUNT BLOG SUITE 1300  
1501 BROADWAY  
NEW YORK, NEW YORK  
BR 9-8700

ANACONDA ASTRODATA CO

VP SALES & MKTG  
A. L. GINTY  
MKTG MGR, CATV  
R.A. BROOKS  
SALES MGR CATV SYSTEMS  
O. P. ROBERTS  
MGR, DISTRIBUTION SALES, CATV  
P. LAZANICH  
BRAND NAMES  
XDR  
COMPANY ADDRESS  
1430 SOUTH ANAHEIM BLVD.  
P. O. BOX 3772  
ANAHEIM, CALIF. 92803  
714-635-0150  
COMPANY REPRESENTATIVES  
C. R. MANN  
SALES MGR WESTERN REGION  
1419 BONNIE DOONE TERRACE  
CORONA DEL MAR, CALIF  
714 675 1015  
R. O. OYLYE  
SALES MGR S. E. REGION  
400 PINETREE STREET  
FOREST PARK, GA.  
404-366-7576  
P. K. JOE  
SALES MGR CENTRAL REGION  
RFO NO. 3  
FORT DODGE, IOWA  
515-576-1313  
C. C. MOODY  
SALES MGR. N. CENTRAL REGION  
13808 STEBENS ROAD  
BURNSVILLE, MINN  
612 890-2017  
O. WATERS  
SALES MGR. N. E. REGION  
P. O. BOX 629  
THOUSAND ISLAND PARK, N. Y.  
315 482-9396  
L. FELTS  
SALES MGR. S. CENTRAL REGION  
7839 CLAREMONT DRIVE  
DALLAS, TEXAS

ANCHA ELECTRONICS INC

PRESIDENT  
ROBERT F. ANCHA  
COMPANY ADDRESS  
7011 WEST HIGGINS AVE.  
CHICAGO, ILL. 60656

KEITH ANDERSON CO

SALES MANAGER  
KEITH ANDERSON  
COMPANY ADDRESS  
P. O. BOX 18  
BLACK HAWK, S. OAKOTA 57718  
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BOX 532  
GUAYAMA, PUERTO RICO  
REPS. IN OTHER COUNTRIES  
JOHN NANCE  
SKEENA BROADCASTERS  
BOX 1540  
TERRACE, B. C.  
L. D. STEWART  
WESTERN TELONICS  
110 BAYS WATER ROAD  
RUSHCUTTERS BAY  
N. S. W., AUSTRALIA  
31 64 34

ANDREW CORPORATION

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ROBERT C. BICKEL  
BRAND NAMES  
HELIX  
HUBLOC  
UNIPOLE  
COMPANY ADDRESS  
P.O. BOX 807  
CHICAGO, ILL. 60642  
COMPANY REPRESENTATIVES  
ANDREW CALIFORNIA CORPORAT:ON  
941 E. MARYLIND  
CLAREMONT, CALIF.  
714-626-3505  
ANDREW CALIFORNIA CORPORATION  
701 WELCH ROAD  
PALO ALTO, CALIF.  
415-323-3139  
ANDREW CORPORATION  
P.O. BOX 5897  
WASHINGTON, D.C.  
202-654-2540  
ANDREW INTERNATIONAL CORP.  
P.O. BOX 787  
CHICAGO, ILL.  
312-349-3300  
ANDREW CORPORATION  
P.O. BOX 416  
RIDGWOOD, N. J.  
201-445-2500  
ANDREW CORPORATION  
P.O. BOX 30506  
DALLAS, TEXAS  
214-735-1279  
REPS. IN OTHER COUNTRIES  
ANDREW ANTENNA SYSTEMS  
LOCHGELLY, FIFE, G.B.  
LOCHGELLY 561  
ANDREW ANTENNA COMPANY, LTD.  
608 GATENSURBY STREET  
COQUITLAM, NEW WESTMINSTER,  
BRITISH COLUMBIA  
604-936-6421  
ANDREW ANTENNA COMPANY, LTD.  
P.O. BOX 177  
WHITBY, ONTARIO  
416-668-3348  
ANDREW ANTENNA COMPANY, LTD.  
55 LITTLE ROCK AVENUE  
POINTE CLAIRE  
LACHINE, QUEBEC  
514 695-5365  
ANDREW ANTENNAS PTY., LTD.  
437 ST KILDA RD, MELBOURNE  
VICTORIA, AUSTRALIA  
26-2824

ANSONIA WIRE & CABLE CO

SALES MANAGER  
OON W. HOFFMAN  
BRAND NAMES  
ANKOSEAL  
ANKOBOND  
COMPANY ADDRESS  
111 MARTIN STREET  
ASHTON, R. I. 02864  
401-724-6400

ANTENNA PRODUCTS COMPANY

DIVISION OF ALL PRODUCTS CO  
SALES MANAGER  
GRAY W. HAVENER  
COMPANY ADDRESS  
P.O. BOX 520  
MINERAL WELLS, TEXAS 76067  
COMPANY REPRESENTATIVES  
WALTER A. LAUKAITIS  
618 ELLSWORTH DR.  
SILVER SPRING, MO.  
301 JU 5-3931  
ASSOCIATED ELECTRONICS, INC.  
119 THE GREAT RD.  
BEFORD, MASS.  
617 275-9020  
TELESCO INTERNATIONAL CORP.  
171 MADISON AVENUE  
NEW YORK, N.Y.  
212 MU 3-9420  
M. J. FEIN & CO.  
HARWOOD BLDG.  
SCARSDALE, N.Y.  
914 GR 2-1100  
EAC ASSOCIATES  
53-11 90TH STREET  
ELMHURST, N.Y. 11373  
212 OE 5-0606

API INSTRUMENTS CO

SALES MANAGER  
ROBERT H. PUGSLEY  
COMPANY ADDRESS  
7100 WILSON MILLS ROAD  
CHESTERLAND, OHIO 44026  
216 423-3131  
COMPANY REPRESENTATIVES  
API INSTRUMENTS CO  
175 W WIEUCA RD N E  
ATLANTA, GA  
404 252-2445  
API INSTRUMENTS CO  
1008 E NORTHWEST HWY  
MT PROSPECT, ILL 60057  
312 392-5770  
THUNDERBIRD ENG CO  
4014 A WEST 95TH ST  
PRAIRIE VILLAGE, KANSAS  
913 642-7220  
THUNDERBIRD ENG CO  
6405 E KELLOGG  
WICHITA, KANSAS  
316 684-3941  
SAUL COHEN  
611 TRAPELO RD  
BOSTON, MASS  
617 894-6921  
API INSTRUMENTS CO  
15042 FENKELL AVE  
DETROIT, MICH  
313 273-6078  
ROBERT W. MARSHALL CO  
6106 EXCELSIOR BLVD  
MINNEAPOLIS, MINN  
612 929-0457  
THUNDERBIRD ENG CO  
P O BOX 6156  
ST. LOUIS, MO.  
314 838-6688  
API INSTRUMENTS CO  
162 RT 208 BOX 123  
OKLAHOMA, N J  
201 337-6163  
TECHNICAL SALES INC  
P O BOX 182  
PULASKI, N Y  
315 298-5103  
API INSTRUMENTS CO  
3545 W CHESTER PIKE  
NEWTOWN SQUARE, PA  
215 353-0772  
CAREY-WOLF CO  
P O BOX 12425  
FT WORTH, TEXAS  
817 738-1702  
CAREY-WOLF CO  
P O BOX 60338 4031 BROADWAY  
SUITE 103  
HOUSTON, TEXAS  
713 643-2114

APPARATUS DEVELOPMENT CO INC

BRAND NAMES  
FM/O  
COMPANY ADDRESS  
ORAWER 153  
WETHERSFIELD, CONN, 06109  
COMPANY REPRESENTATIVES  
KOESSLER SALES  
818 N. FAIRFAX,  
LOS ANGELES, CAL.  
JAS. PIPER ASSOCIATES  
10 HAVEN,  
DOVER, MASS.  
L. D. RODOEY SALES  
4242 WATERBURY DR.  
CHARLOTTE, N. C.  
CHAS LUCAS SALES  
BOX 8506  
DALLAS, TEX  
VECTOR CORP  
307 WALL ST.  
SEATTLE, WASH

ATLAS SOUND DIVISION

AMERICAN TRADING & PRODUCTION CORP  
SALES MANAGER  
JEROME W. HELLER  
BRAND NAMES  
ATLAS  
COMPANY ADDRESS  
10 POMEROY ROAD  
PARSIPPANY, N. J. 07054  
COMPANY REPRESENTATIVES  
BASSETT & MOORE  
12045 MAGNOLIA BLVD.  
N. HOLLYWOOD, CAL.  
213-766-2117  
F. W. MOULTHROP & ASSOCIATES  
1530 E. 12TH ST.  
OAKLAND, CAL.  
261-7676  
GORDON MOSS ELECTRONICS  
P.O. BOX J  
GREELEY, COLORADO 80632  
353-1452  
CARTWRIGHT & BEAN  
20100 NE 25TH COURT  
N. MIAMI BEACH, FLA.  
945-2962  
CARTWRIGHT & BEAN  
395 TRITON RD.  
ORMOND BEACH, FLA.  
OR 7-3480  
CARTWRIGHT & BEAN  
2505 NANCY STREET  
ORLANDO, FLA.  
GA 5-8284  
CARTWRIGHT & BEAN  
3223 CAINS HILL PLACE NW  
ATLANTA, GA.  
237-2273  
BRUCE CUMMING & ASSOCIATES  
6029 W. BELMONT AVENUE,  
CHICAGO, ILL.  
312 ME 7-3770  
THOMAS & SUKUP  
2060 EAST 54TH ST.  
INDIANAPOLIS, INO.  
CL 1-4574  
KOENIG-MYERS ASSOCIATES  
7603 DENNIS DRIVE  
DES MOINES, IOWA  
515 276-3777  
KOENIG-MYERS ASSOCIATES

APPLIED ELECTRO MECHANICS INC

SALES MANAGER  
COL. GEORGE GLEN  
BRAND NAMES  
AEM  
COMPANY ADDRESS  
2350 DUKE STREET  
ALEXANDRIA, VA. 22314  
703 548-2166  
COMPANY REPRESENTATIVES  
W. S. FLOGAUS  
6631 WAKEFIELD DRIVE  
ALEXANDRIA, VA. 22307  
703-768-4964

ARRIFLEX CORPORATION OF AMERICA

SALES MANAGER  
VICTOR JAMES  
BRAND NAMES  
ARRIFLEX  
SIEMENS  
COMPANY ADDRESS  
25-20 BRKLYN-QUEENS EXPWY W  
WOODSIDE, NEW YORK 11377

ASCO SONOCRAFT CORP

SALES MANAGER  
FRED LISSER  
BRAND NAMES  
ASCO  
ASCO/SONOCRAFT  
COMPANY ADDRESS  
115 W. 45TH ST  
NEW YORK, N. Y. 10016  
JU 2-1750

THE ASTATIC CORPORATION

COMPANY ADDRESS  
BOX 120  
CONNEAUT, OHIO 44030

COMPANY REPRESENTATIVES  
BASSETT & MOORE  
12045 MAGNOLIA BLVD.  
NORTH HOLLYWOOD, CALIF. 91607  
877-7129  
WILLIAM J. PURDY CO.  
312 SEVENTH ST.  
SAN FRANCISCO, CALIF. 94103  
415-863-3300  
CONNORS, INC.  
2241 STACY DR.  
DENVER, COLORADO 80221  
428-1575  
HOLLINGSWORTH & STILL  
3098 PIEDMONT RD. N. E.  
ROOM 100  
ATLANTA, GA. 30305  
OUGHERTY ENTERPRISES  
P. O. BOX 3497,  
1164 WAIMANU ST.  
HONOLULU, HAWAII 96811  
MARKAL SALES CORP.  
5787 N. LINCOLN AVE.  
CHICAGO, ILLINOIS 60645  
LONGBEACH 1-7290  
EDWIN A. SCHULZ CO.  
BOX 40305, 721 SHERWOOD DR.  
INDIANAPOLIS, INDIANA 46240  
ANDERSON SALES CO.  
177 STATE ST.  
BOSTON, MASS. 02109  
617 CAPITOL 72980  
ROBERT MILSK CO.  
19375 JAMES COUZENS HWY.  
DETROIT, MICHIGAN 48235  
313 342-6660  
MEL E. FOSTER CO, INC.  
228 S. CEDAR LAKE RD.  
MINNEAPOLIS, MINN. 55405  
MAURY E. BETTIS CO.  
3706 BROADWAY  
KANSAS CITY, MISSOURI  
417 LOGAN 1-0772  
JERRY KRISHBAUM & CO.  
1533 PENINSULA BLVD.  
HEWLETT, L. I. N. Y.  
FRANKLIN 4-0111  
PASTON-HUNTER CO, INC.  
2002 TEAL AVE.  
SYRACUSE, N. Y. 13206  
315 437-2992  
MIKE ROTH SALES CO.  
678 SO. GREEN RD.  
CLEVELAND, OHIO 44121  
EV 2-9090  
DALE G. WEBER CO.  
WEATHERLY BLDG, SUITE 306  
PORTLAND, OREGON 97214  
503 234-0686  
LOWERY ASSOC. CO.  
2801 W. CHESTER PIKE  
BROOMALL, PA. 19008  
EL 6-5300  
CARTWRIGHT & BEAN  
CROSSTOWN STA. BOX 760,  
560 S. COOPER ST.  
MEMPHIS, TENN.  
J. Y. SCHOONMAKER CO, INC.  
5328 REDFIELD  
P. O. BOX 35266  
DALLAS, TEXAS 75235  
214 ME1-8480

P. O. BOX, 374  
SHAWNEE MISSION, KAN. 66201  
ME 2-8300  
CARTWRIGHT & BEAN  
1812 BULLARD AVE  
METAIRIE, LA.  
504-887-0482  
LOWERY ASSOCIATES  
6200 ANNAPOLIS RD.  
MYATTSVILLE, MD  
773-4977  
ROBERT MILSK CO.  
19375 JAMES COUZENS HWY.  
DETROIT, MICH  
342-6660  
JIM PIPER ASSOCIATES  
BOX 21  
SOUTH DUXBURY, MASS.  
WE 4-2498  
JIM PIPER ASSOCIATES  
10 HAVEN ST  
DOVER, MASS  
449-1144  
CLARK R. GIBB COMPANY  
1311 W. 25TH STREET  
MINNEAPOLIS, MINN.  
612-377-1200  
KOENIG-MYERS ASSOCIATES  
2721 BELOIT DRIVE  
BRIDGEOTON, MO.  
PE 9-1655  
GORDON MOSS ELECTRONICS  
2418 BARCELONA DRIVE SW  
ALBUQUERQUE, NEW MEXICO  
IRV BROWN CO.  
401 KINGSTON BLVD.  
BROOKLYN, N. Y.  
HY 3-1379  
PASTON-HUNTER CO. INC.  
2002 TEALL AVENUE  
SYRACUSE, N. Y.  
315-437-2992  
F. A. DAUGHERTY  
6025 MAYFIELD RD.  
CLEVELAND, OHIO  
449-1122  
MARSHALL JAMES  
3950 SOUTH ELMRAN  
LAKE OSWEGO, ORE.  
636-5777  
COOPER-DAUGHERTY SALES CO.  
112 OAKWOOD RD.  
MCURRAY, PA. 15317  
941-6473  
LOWERY ASSOCIATES  
2801 WEST CHESTER PIKE  
BROOMALL, PA.  
EL 6-5300  
LOWERY ASSOCIATES  
1501 ALLISON STREET  
HARRISBURG, PA.  
233-0917  
CARTWRIGHT & BEAN  
560 S. COOPER ST.  
MEMPHIS, TENN.  
BR 6-4442  
J. Y. SCHOONMAKER CO.  
5328 REDFIELD AVE.  
DALLAS, TEX.  
WE 1-8480  
J. Y. SCHOONMAKER CO.  
107 WINNTEKA,  
SAN ANTONIO, TEXAS  
DIAMOND-2-0251  
NORTHWESTERN AGENCIES  
4130 FIRST AVE.  
SEATTLE, WASH  
MA 3-8882  
BRUCE CUMMING & ASSOCIATES  
5537 N. ARGYLE AVE.  
MILWAUKEE, WIS.  
372-7650  
REPS. IN OTHER COUNTRIES  
ATLAS RADIO CORPORATION  
50 WINGOLD AVENUE  
TORONTO, ONTARIO  
416-RU 1-6174

**AUDIO ACCESSORIES, INC.**

**BRAND NAMES**  
AUDIO-LINE  
COMPANY ADDRESS  
GILSUM, N. H. 03448  
COMPANY REPRESENTATIVES  
KOESSLER SALES, CO.  
818 NORTH FAIRFAX AVE  
LOS ANGELES, CAL. 90046  
213 653-1605  
KOESSLER SALES, CO.  
1485 BAYSHORE  
SAN FRANCISCO, CAL. 94124  
415 584-1818  
S. GLASSMAN ASSOCIATES, INC.  
28 PRESTWICK TERRACE  
GLEN COVE N. Y. 11542  
516 676-1039  
DETI SALES  
601 LODI, ST.  
RIO PIEORAS, P R 00924  
765-8080

**AUDIO DEVICES, INC.**

**SALES MANAGER**  
RICHARD VAUGHAN  
**BRAND NAMES**  
AUDIOTAPE  
AUDIOPAK & ASSOCIATES  
AUDIOFILM  
AUDIODISCS  
AUDIOPOINTS  
AUDEV  
COMPANY ADDRESS  
235 EAST 42ND STREET  
NEW YORK, NEW YORK 10017  
COMPANY REPRESENTATIVES  
AUDIO DEVICES, INC.

1426 FLOWER ST.  
GLENDALE, CALIF  
213 245-6587  
AUDIO DEVICES, INC.  
16466 WOODACRES RD.  
LOS GATOS, CALIF.  
408 245-6802  
KOESSLER SALES CO.  
318 NO. FARIFAX AVE.  
LOS ANGELES 46, CALIF.  
213-853-1605  
MEYER, ROSS & FLEMING  
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**BBRC** provides versatile, economical equipment to commercial stations—and also enhances the capabilities of educational TV stations, university workshops and closed circuit systems. All equipment is simple to install, easy to operate, and features the long-term stability and low maintenance of solid-state circuitry.

**THE MARK VI** Special Effects Generator is a moderately priced, self-contained unit designed to meet commercial black and white television broadcast standards. Two models are available: a standard rack-mounted Mark VI-A, and a remote-controlled Mark VI-AR (SHOWN BELOW). Both provide three basic wipes, external video keying, and independent selective matting of background information in any value of gray from black to white. The Mark VI can serve as an ideal standby generator, an auxiliary unit for a second studio, or can be used in mobile van operations. Prices start from \$1375.00.

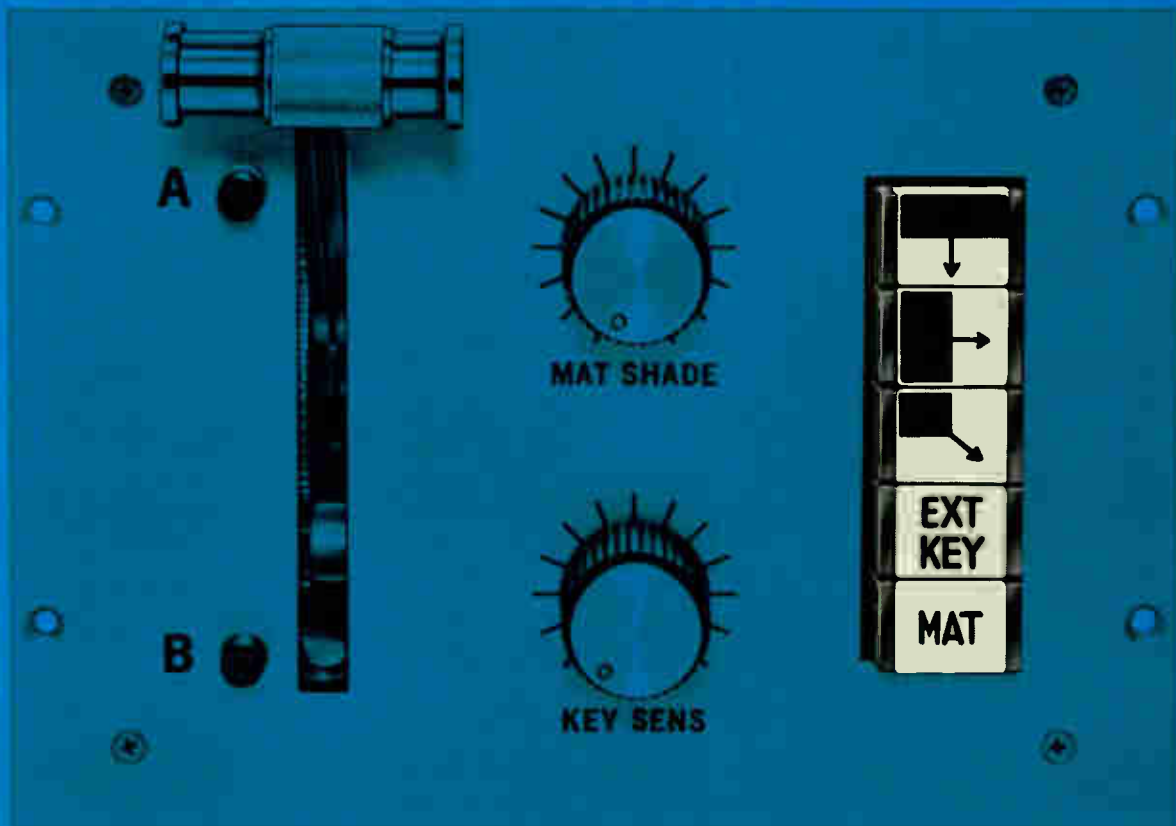
**THE MARK VII** is an advanced Color Special Effects Generator designed for the most critical studio applications. The Mark VII is capable of color inserts (color matting). The output video of the unit can be the combination of background video and artificially-generated color inserts—with any color within the NTSC spectrum generated by manual control settings. A non-additive mixing technique, insensitive to variations in video brightness levels, is incorporated for new effects with lap dissolves. The basic system accepts a variety of monochrome or color signals in either composite or non-composite format at the inputs. In addition to keying effects, as many as fourteen wipes can be provided. Prices from \$1810.00. Write for additional information.

# DEPENDABLE BROADCAST TELEVISION EQUIPMENT

FROM BALL BROTHERS  
RESEARCH CORPORATION

**THE MARK VIII** Automatic Gain Control (AGC) Video Amplifier was developed to provide continuous monitoring of video signals from a variety of originating equipment. It is available in two models: one for use in studios where local drives can be supplied, and the other where drive pulses are derived from composite video signals originating outside the studio, or from VTR's. Both have full color capabilities, and are designed to compensate for both video and set-up levels over a  $\pm 6$ db range. It is ideally suited to follow film chains and live cameras, or network originations. It is also used ahead of video tape recorders and standard transmission lines where signals are limited to precise levels to prevent distortion. Prices from \$3340.00.

**THE MARK IX** Video and Pulse Distribution Amplifiers were developed specifically for color studio operations. Up to ten video or pulse amplifiers (or any combination of both) can be plugged into the Mark IX chassis to provide as many as 40 isolated signal outputs at one central distribution point. The Mark IX Video Amplifier requires no high frequency adjustment because of its wideband frequency response characteristics. Differential gain and phase measurements are shown for all input signal conditions at 0.25 percent and 0.25 degrees, respectively. The Pulse Amplifier has highly isolated signal outputs with an impedance of 75 ohms terminated at the sending end. Each amplifier has bridging or looping input drive signal provisions. The active circuitry maintains constant pulse rise times of less than 50 nanoseconds and is compensated for possible component replacement. Pulse delay of less than 50 nanoseconds is measured at the output. Prices: Video Pulse Amplifier, \$295.00 each; Electronic Housing, \$275.00.



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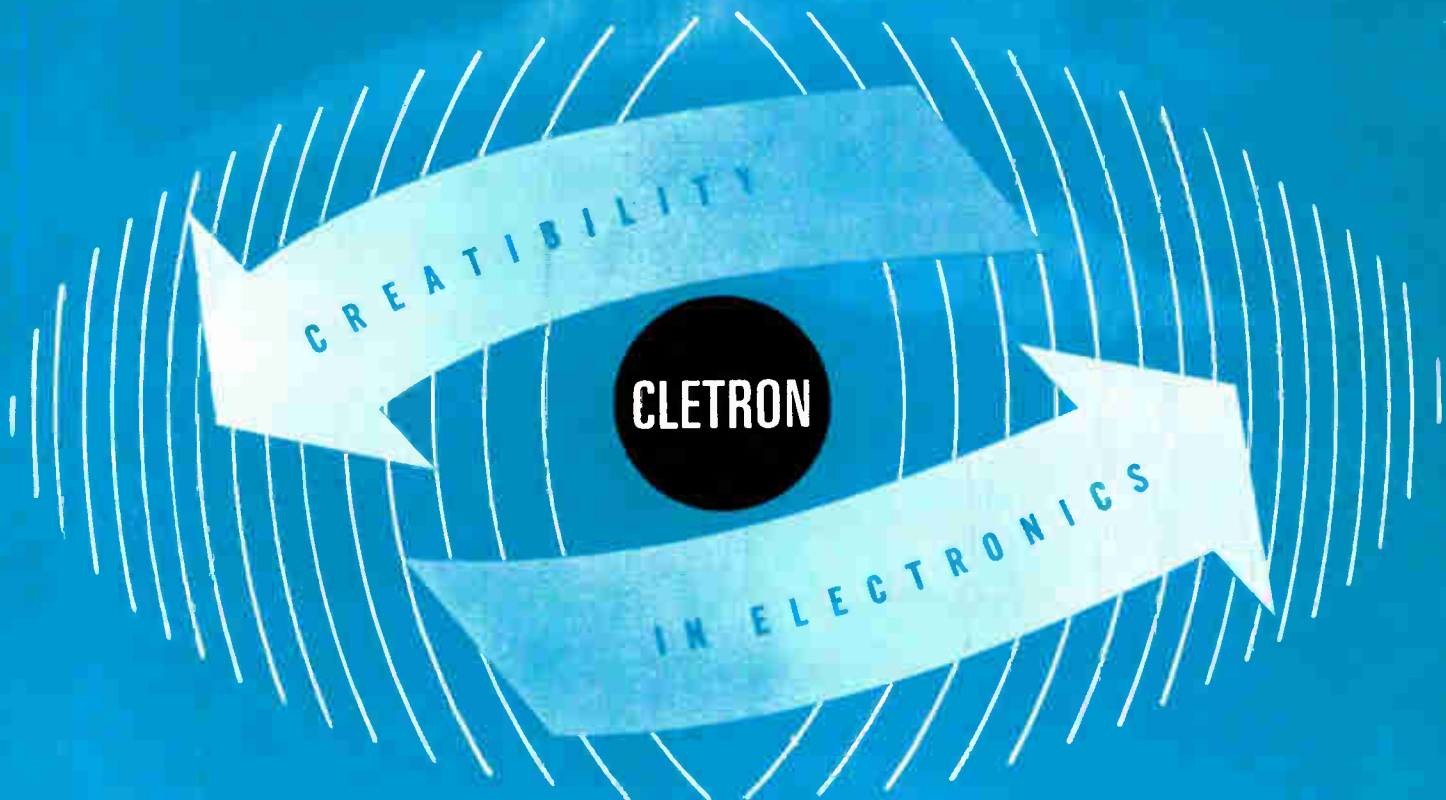
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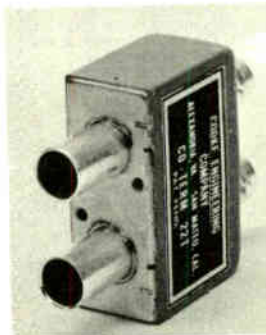
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MYTCHETT, CAMBERLEY  
SURREY, ENGLAND  
SPECIAL-IND  
VIA D. MANIN 33  
MILAN, ITALY  
ELOFYSCIA N-V-AMSTEROAM  
WFERINGSCHANS 120  
AMSTERDAM-C, HOLLAND  
DATAMATIK  
GRONLANDESLEIRET 31  
OSLO, NORWAY  
UNITRONICS  
TOREE DE MADRID  
PISO 12-OFICINA 9  
PLAZA DE ESPANA  
MADRID 13, SPAIN  
SCANTELF AB  
TENGAHLGATAN 24  
STOCKHOLM, SWEDEN  
RAFRLOCHER AG  
FDERRLRUCKSTRASSE 110  
ZURICH 8021, SWITZERLAND  
EASTRONICS LTD  
22 MAZE STREET  
TEL AVIV, ISRAEL 22867  
ATLAS INSTRUMENTS CORP  
DIV OF ATLAS ELECTRONICS LTD  
50 WINGLOD AVENUE  
TORONTO, ONTARIO  
ATLAS INSTRUMENTS CORP  
DIV OF ATLAS ELECTRONICS LTD  
342 1/2 ELGIN STREET  
OTTAWA, ONTARIO  
ATLAS INSTRUMENTS CORP  
333 CAVENDISH BLVD.  
SUITE 390  
MONTREAL, QUEBEC  
SAMPLE ELECTRONICS PTY LTD  
4 GRDSE STREET GLEBE  
SYDNEY, N.S.W., AUSTRALIA  
SAMPLE ELECTRONICS PTY LTD  
9/11 CREMORNE STREET  
RICHMOND E, T.  
VICTORIA, AUSTRALIA

DAYTON ELECTRONIC PRODUCTS CO  
COMMERCIAL SALES MANAGER  
HANK JOSEFCZYK  
COMPANY ADDRESS  
117 E. HELENA ST.  
DAYTON, OHIO 45404  
513 461 4951

D & B ELECTRONICS CO  
SALES MANAGER  
VICTOR BRUNO  
COMPANY ADDRESS  
3611 ESSEX LANE  
PHILADELPHIA, PA. 19114  
215-NE7-2786

DEARBORN ELECTRONICS, INC.  
SUBSIDIARY SPRAGUE ELECTRIC CO  
MARKETING MANAGER  
CHARLES T. LITTLE  
COMPANY ADDRESS  
P.O. BOX 530  
ORLANDO, FLORIDA 32802  
COMPANY REPRESENTATIVES  
SPRAGUE ELECTRIC CO  
3550 N CENTRAL AVENUE  
PHOENIX, ARIZONA 85012  
602 279 5435  
WM J PURDY OF CALIF  
312 7TH STREET  
SAN FRANCISCO, CALIF 94103  
415 863 3300  
SPRAGUE ELECTRIC CO  
12870 PANAMA STREET  
LOS ANGELES, CALIF 90066  
213 870 D161  
SPRAGUE ELECTRIC CO  
5670 E EVANS AVENUE  
DENVER, COLO 80222  
303 756 3611  
SPRAGUE ELECTRIC CO  
3900 WISCONSIN AVE NW

WASHINGTON, D. C. 20016  
202 244 6006  
W BEN WIMBERLY CO  
532 S FORT HARRISON  
CLEARWATER, FLORIDA 33516  
813 446 7072  
W BEN WIMBERLY CO  
500 S DSCEDLA STREET  
ORLANDO, FLORIDA 32801  
305 425 3083  
SPRAGUE ELECTRIC CO  
5942 W MONTRDSE AVENUE  
CHICAGO, ILLINOIS 60634  
312 685 6400  
SPRAGUE ELECTRIC CO  
2511 E 46TH STREET  
INDIANAPOLIS, INDIANA 46205  
317 546 4911  
ROTENHEBER & CO., INC.  
14211 CHESTERFIELD RDAO  
ROCKVILLE, MO 20853  
301 929 3388  
TOM CRAWFORD AND SON  
PO BOX 264  
NORWOOD, MASS 02062  
617 762 6914  
SPRAGUE ELECTRIC CO  
NORTH ADAMS, MASS 01248  
313 664 4411  
SPRAGUE ELECTRIC CO  
259 COLLINGWOOD  
ANN ARBOR, MICH 48103  
313 761 4080  
DAYTON ENG SALES  
1820 FAIRFIELD RDAO S  
MINNETONKA, MINN 55343  
612 545 2221  
SPRAGUE ELECTRIC CO  
3910 LINDELL BLVD  
ST LOUIS, MO 63108  
314 535 7239  
CLARFIELD-STOLLMAK ASSDC  
175 WESTWOOD AVENUE  
WESTWOOD, N J 07675  
201 666 8989  
C T CARLBERG & ASSOC  
PO BOX 3177, STA D  
ALBUQUERQUE, N M 87110  
505 265 1579  
JOSEPH F RIZZO CO - EXPDRT  
ROOM 5710  
EMPIRE STATE BLDG  
NEW YORK, N Y 10001  
212 736 0398  
SPRAGUE ELECTRIC CO  
928 BURKE STREET  
WINSTON-SALEM, N.C. 27101  
919 722 5151  
SPRAGUE ELECTRIC CO  
24 N MAIN STREET  
CHAGRIN FALLS, OHIO 44022  
216 247 6488  
SPRAGUE ELECTRIC CO  
224 LED STREET  
DAYTON, OHIO 45404  
513 223 9187  
ROTENHEBER & CO., INC.  
53 CRICKET AVENUE  
ARMORE, PENNA 19003  
215 642 6911  
DELZELL & EVANS ASSDC  
PO BOX 35093  
DALLAS, TEXAS 75235  
214 351-1839  
SPRAGUE ELECTRIC CO  
4601 AURORA AVENUE NDRTH  
SEATTLE, WASH 98103  
206 632 7761  
REPS. IN OTHER COUNTRIES  
A DESKIN SALES CORP  
1565 LOUVAIN STREET W  
MONTREAL 11, QUEBEC  
514 384 1420

DELCO RADIO DIV.  
GENERAL MOTORS CORP  
SALES MANAGER  
P A SANDBERG  
COMPANY ADDRESS  
700 E FIRMIN ST  
KOKOMO, IND 46901  
457 8461  
BRANCH OFFICES  
726 SANTA MONICA BLVD  
SANTA MONICA, CALIF 90401  
393 1465  
5151 N HARLEM AVENUE  
CHICAGO, ILL 60656  
775 5411  
57 HARPER STREET  
DETROIT, MICH 48202  
873 6560  
324 CHESTNUT STREET  
UNION, N J 07083  
687 3770  
1054 JAMES STREET  
SYRACUSE, N Y 13203  
474 6255

DELTA ELECTRONICS, INC  
SALES MANAGER  
LARRY HANCOCK  
COMPANY ADDRESS  
145 FAYETTE ST  
WINSTON-SALEM, N.C. 27101  
COMPANY REPRESENTATIVES  
LONG ENGINEERING CO  
961 BURKE STREET  
WINSTON-SALEM, N.C. 27101  
725-2306

DELTA ELECTRONICS INC  
SALES MANAGER  
ROBERT H FOLEY  
COMPANY ADDRESS  
4206 WHEELER AVENUE

ALEXANDRIA, VA 22304  
COMPANY REPRESENTATIVES  
REYNOLDS & ASSOC INC  
P O BOX 1043  
EAU GALLIE, FLA  
305 254 0520  
M J FEIN & CO  
HARWOOD BLDG P O BOX 28  
SCARSDALE, NEW YDRK  
914 GR 2 1100  
ROCKE INTERNATIONAL CORP  
13 EAST 40TH ST  
NEW YORK, NEW YORK  
MU 9 0200  
ASHBY ASSOCIATES INC  
CLAYPOOL BLDG SUITE 155  
4130 LINDEN AVE  
DAYTON, OHIO  
513 224-0561

DEMORNAY-BONARDI  
DIV. OF DATAPULSE, INC.  
SALES MANAGER  
PAUL A. LIST  
COMPANY ADDRESS  
1313 N. LINCOLN AVE.  
PASADENA, CALIF. 91103  
213 681-7416  
TWX 910 588-3282  
COMPANY REPRESENTATIVES  
W A BROWN & ASSOCIATES, INC  
1314 BUFORD STREET, N W  
HUNTSVILLE, ALA. 35801  
R F ASSOCIATES, INC.  
1621 PONTIUS AVENUE  
LOS ANGELES, CALIF. 90025  
RF ASSOCIATES, INC  
800 SAN ANTONIO ROAD  
PALO ALTO, CALIF. 94303  
KELLEY ENTERPRISES  
336 E 4TH STREET  
LOVELAND, COLORADO 80537  
W A BROWN & ASSOCIATES, INC  
222 WEBER AVENUE  
ORLANDO, FLA. 32803  
W A BROWN & ASSOCIATES, INC  
3039 N E 32ND AVENUE  
FT. LAUDERDALE, FLA. 33308  
RIDGWAY ASSOCIATES, INC  
3759 N HARLEM AVENUE  
CHICAGO, ILLINOIS 60634  
PENNZER ASSOCIATES, INC  
P O BOX 4362  
OVERLAND PARK, KANSAS 66204  
CONNAUGHTON & COMPANY  
18 BOWHELL ROAD  
BRIGHTON, MASS. 02135  
RIDGWAY ASSOCIATES, INC  
7720 MORGAN AVENUE SOUTH  
MINNEAPOLIS, MINNESOTA 55423  
PENNZER ASSOCIATES, INC  
BOX 26, CREVE COEUR STATION  
ST. LOUIS, MO. 63141  
CENTRAL ASSOCIATES, INC  
44 N DEAN STREET  
ENGLEWOOD, N.J. 07631  
CENTRAL ASSOCIATES, INC  
111 COMMERCIAL STREET  
PLAINVILLE, L.I., N.Y., 11803  
J D RYERSON ASSOCIATES INC  
P O BOX 1400  
SYRACUSE, NEW YORK 13201  
W A BROWN & ASSOCIATES, INC  
440 WEST-END BLVD  
WINSTON-SALEM, N.C. 27101  
RIDGWAY ASSOCIATES  
2400 E DOROTHY LANE  
DAYTON, OHIO 45420  
RIDGWAY ASSOCIATES, INC  
22811 LORAIN ROAD  
FAIRVIEW PARK, OHIO 44126  
R K P ASSOCIATES  
107 FORREST AVENUE  
HARBERTH, PA. 19072  
MITCHELL SPEARS COMPANY  
4944 JAMES AVENUE  
FORT WORTH, TEXAS 76115  
MITCHELL SPEARS COMPANY  
HOUSTON OFFICE CENTER  
ROOM 109C  
HOUSTON, TEXAS 77023  
W A BROWN & ASSOCIATES, INC  
325 FIRST STREET  
ALEXANDRIA, VIRGINIA 22314  
RAY JOHNSTON COMPANY, INC  
1011 NORTHEAST 69TH STREET  
SEATTLE, WASH. 98115  
REPS. IN OTHER COUNTRIES  
TOSHNIWAL BROS PRV LTD  
198, JAMSHEDJI TATA RD  
BOMBAY-1, INDIA  
P O BOX NIBONBASHI  
173 TOKYO JAPAN  
WEN CHANG HONG  
IMPORTERS & EXPORTERS  
ND 23, CHUNG-CHENG ROAD  
TAINAN, TAIWAN  
SHOSHIN SHOJI KAISHA, LTD  
P O BOX NIBONBASHI  
173, TOKYO, JAPAN  
DANIEL DELGAY S A  
BOITE PDSTATE 919  
58A CHAUSSEE DE CHARLERDL  
BRUSSELS, BELGIUM  
OLTRONIX A/S  
MALTTEGAARDEVEJ 18  
GENTOFTE, DENMARK  
MEGEX  
105 QUAI BRANLEY  
PARIS 15E, FRANCE  
TELCO-GESELLSCHAFT FUR MESS  
UND FUNKTECHNIK  
FRANZ - PRUELLTERSTRASSE 15  
MUNICH 8, WEST GERMANY  
C T LONDON LIMITED  
27 ASHLEY PLACE



617 891-4560  
TXW 617-894-8594  
2005 ROUTE 22  
CORNER FAIRWAY DRIVE  
UNION, N.J. 07083  
201 688-8800  
TXW 201 687-9514  
1500 KINGS HIGHWAY  
CHERRY HILL, N.J. 08034  
609 428-6800  
TXW 609 429-4105  
847 JAMES STREET  
SYRACUSE, N.Y. 13203  
315 472-7051  
TXW 315 477-1240  
SOUTHMOOR BUILDING  
10 SOUTHMOOR CIRCLE  
DAYTON, OHIO 45429  
513 298-7318  
TXW 513 944-0546  
FIRST BANK & TRUST BLDG.  
P O BOX 689  
RICHARDSON, TEXAS 75081  
214 235-2385  
TXW 214 231-1403  
1678 SOUTH PIONEER ROAD  
SALT LAKE CITY, UTAH  
801 487 7561  
714 CHURCH STREET  
ALEXANDRIA, VIRGINIA 22314  
703 549-8205  
TXW 703 931-4210

#### EITEL ELECTRONICS

SALES MANAGER  
GEORGE E. EITEL  
BRAND NAMES  
EITELCO  
COMPANY ADDRESS  
P O BOX 830  
211 E SHELTON  
PRESCOTT, ARIZONA 86301  
602 445 0691

#### ELECTROLINE TELEVISION

EQUIPMENT INC.  
PRESIDENT  
MAURICE OLFMAN  
980 NE 170 ST  
N MIAMI BEACH, FLA 33161  
305 949 0933  
COMPANY ADDRESS  
BOX 324  
ULETA, FLA 33164  
COMPANY REPRESENTATIVES  
JEROME GUARDINO  
16 EAST 23RD STREET  
NEW YORK, N.Y. 10010  
212 OR 3-5670  
REPS. IN OTHER COUNTRIES  
HENRY PALL  
DOMINION SQUARE BLDG.  
MONTREAL, QUEBEC  
514 878-9489

#### ELECTRONIC LIGHTS, INC.

SALES MANAGER  
JAMES V. DANIELS  
BRAND NAMES  
SURGELITE  
STROBELITE  
COMPANY ADDRESS  
1713 NORTH ASHLAND AVE  
CHICAGO, ILL 60622

#### ELECTRONIC MOBILE UNITS

COMPANY ADDRESS  
788 PATERSON AVE  
EAST RUTHERFORD, N J  
201 933 3555

#### ELECTRONIC RESEARCH COMPANY

SALES MANAGER  
H. M. DANZIG  
COMPANY ADDRESS  
10000 WEST 75TH STREET  
OVERLAND PARK, KANSAS 66204  
COMPANY REPRESENTATIVES  
WM J PURDY CO  
312 SEVENTH ST  
SAN FRANCISCO, CALIF  
415 863 3300  
SHEPARD WINTERS CO  
4109 BURBANK BLVD  
BURBANK, CALIF  
213 849 6671  
STAN PIERCE, INC  
115 BALD HILL ROAD  
NEW CANAAN, CONN  
203 966 4630  
ORBE, INC  
300 31ST ST N, SUITE 439  
ST PETERSBURG, FLA  
813 894 0687  
ORBE, INC  
1020 GREGORY DR  
MAITLAND, FLA  
305 424 0978  
ORBE, INC  
476 LORIDANS DR, NE  
ATLANTA, GA  
404 233 6453  
WHITMORE ASSOCIATES, INC  
4750 W MILWAUKEE  
CHICAGO, ILL  
312 286 2442  
FLORENCE & MEYER, INC  
2900 WOODLAND  
WICHITA, KANSAS  
316 TE B 7226  
HARRY J WHITE CO  
320 HILLEN RD  
TOWSON, MD 21204  
301 VA 8 6373  
STAN PIERCE, INC

24 LINDEN ST  
NORWOOD, MASS 02062  
617 762 3164  
FLORENCE & MEYER, INC  
406 W 34TH ST  
KANSAS CITY, MO  
816 LO 1 7282  
FLORENCE & MEYER, INC  
BOX 5806  
BERKLEY, MO 63134  
314 JA 1 6800  
COMP TECH SALES  
BOX 50  
RIVERDALE, N J 07457  
201 835 0332  
INTERNATIONAL ELECTRO-COMP CO7  
BOX 353  
PINE BROOK, N J 07058  
201 335 1822  
HARRY J WHITE CO  
801 W MARLTON PIKE  
CHERRY HILL, N J  
609 428 2304  
COMP TECH SALES  
BOX 384  
LYNBROOK, N Y 11563  
516 593 2628  
LAWRENCE SALES CO  
BOX 1038  
RICHARDSON, TEXAS  
214 AD 5 5504  
REPS IN OTHER COUNTRIES  
ELECTRODESIGN, LTD  
9124 ST LAWRENCE BLVD  
MONTREAL, QUEBEC  
514 389 5914

#### ELECTRONICS ESSENTIALS

OF CCC, INC.  
PRESIDENT  
JOSEPH V MITCHELL  
BRAND NAMES  
VERAVOX  
ARMCO  
COMPANY ADDRESS  
4424 FURMAN AVE  
BRONX, N Y 10466

#### EMCEE -

ELECTRONICS, MISSILES,  
COMMUNICATIONS, INC.  
SALES MANAGER  
GARR JOHNSON  
BRAND NAMES  
EMCEE  
COMPANY ADDRESS  
160-E-3 STREET  
MT. VERNON, NEW YORK

#### ELECTRONIC SYSTEM ENGINEERING

SALES MANAGER  
A. A. KAMINSHINE  
BRAND NAMES  
LIMPANDER  
SPEEDMASTER  
COMPANY ADDRESS  
120 1/2 N CLEVELAND  
CUSHING, OKLAHOMA 74023

#### ELECTRO PRODUCTS

LABORATORIES, INC.  
SALES MANAGER  
R. H. NOVIC  
BRAND NAMES  
ELECTRO  
COMPANY ADDRESS  
6125 W. HOWARD  
CHICAGO, ILLINOIS 60648  
COMPANY REPRESENTATIVES  
HYDE ELECTRONICS CO, INC  
4710 N 16TH ST, SUITE 109  
PHOENIX, ARIZ  
602 264 5609  
CARTER & ROSSNEY ASSOC  
2600 W OLIVE AVE  
BURBANK, CALIF  
213 843 3292  
LOGAN SALES CO  
463 BREWSTER AVE  
REDWOOD CITY, CALIF  
415 369 6726  
HYDE ELECTRONICS CO, INC  
888 S LIPAN ST  
DENVER, COLO  
303 936 3456  
COAKLEY, BOYD & ABBETT, INC  
6 GAYWOOD DR  
WATERBURY, CONN  
203 756 8766  
MURPHY & COTA  
712 W VASSAR AVE  
ORLANDO, FLA  
305 424 2167  
MURPHY & COTA  
586 ARMOUR CIRCLE, N E  
ATLANTA, GA  
404 875 2525  
GETTLEMAN & LITTEKEN CO  
3736 DEMPSTER ST  
SKOKIE, ILL  
312 588 0030  
FISHMAN ASSOCIATES  
2060 E 54TH ST UNIT # 1  
INDIANAPOLIS, INO  
317 251 2401  
COAKLEY, BOYD & ABBETT, INC  
1424 HIGHLAND AVE  
NEEDHAM, MASS  
617 444 5470  
DAVID MILSK CO  
20110 OLYMPIA AVE  
DETROIT, MICH  
313 535 4012  
A J WARNER CO  
5022 29TH AVENUE S

MINNEAPOLIS, MINN  
612 729 7371  
PAUL G SCHOLZ CO  
7309 E 109 TERRACE  
KANSAS CITY, MO  
816 761 6522  
HYDE ELECTRONICS CO, INC  
5206 CONSTITUTION AVE N E  
ALBUQUERQUE, N M  
505 265 8895  
CALLAHAN-FERGUSON CO  
107 GREENHEDGE DR  
CAMILLUS, N Y  
315 488 2518  
MURPHY & COTA  
P O BOX 6365  
GREENSBORO, N C  
919 273 6288  
LES A MORROW CO  
3123 W 117TH ST  
CLEVELAND, OHIO  
216 251 5700  
JOHN MUSTICO CO  
312 BEWLEY ROAD  
HAVERTOWN, PA  
215 446 1961  
JAMES H PODOLNY CO  
5912 PENN AVE  
PITTSBURGH, PA  
412 441 0800  
THE TEXPORT CO  
5104 CAPEEN ST  
MEMPHIS, TENN  
901 682 4777  
THE TEXPORT CO  
2411 FARRINGTON ST  
DALLAS, TEXAS  
214 631 6270  
THE TEXPORT CO  
8811 GAYLOR ROOM 206  
HOUSTON, TEXAS  
713 464 3031  
HYDE ELECTRONICS CO, INC  
3081 DELSA DR  
SALT LAKE CITY, UTAH  
801 278 4465  
DOM SMITH SALES CO  
2320 N 45TH ST  
SEATTLE, WASH  
206 633 3160  
STEVE FISHER SALES CO  
121 CEDAR LANE  
TEANECK, NEW JERSEY  
201 836 6661

#### ELECTRO-SOUND ACOUSTICS,

DIVISION OF RAYCO SOUND CO.  
SALES MANAGER & PRESIDENT  
RAYMOND L. IHMORIS  
BRAND NAMES  
ESA  
PRO-CLASSIC  
FUSISTANCE  
ELECTRO-SOUND ACOUSTICS  
COMPANY ADDRESS  
128 WHITMOOR TERRACE  
SILVER SPRING, MARYLAND 20901  
301 593 6455  
COMPANY REPRESENTATIVES  
BETTER ELECTRONICS CO  
7114 WOODLAND AVE  
TAKOMA PARK, MD 20012  
301 589 8610

#### ELECTROVERT INC

SALES MANAGER  
F. J. FARRELL  
BRAND NAMES  
CRADLECLIP  
SPIROBANO  
GROMMET STRIP  
COMPANY ADDRESS  
86 HARTFORD AVE  
MT. VERNON, NEW YORK 10553  
COMPANY REPRESENTATIVES  
CONSTRUCTION SPECIALTIES  
10 EAST SECOND STREET  
SCOTTSDALE, ARIZONA  
CLIFFORD L WOOLSEY  
1029 N BRIGHTON ST  
BURBANK, CALIF 91506  
213 849 5341  
J A WAUGHMAN ASSOC INC  
2785 NORTH SPEER  
DENVER, COLO 80211  
303 292 3926  
H R GROSS & CO  
314 SOUTH MISSOURI AVE  
P O BOX 1427  
CLEARWATER, FLA 33517  
813 446 6649  
LOUIS E BRUNS CO  
2210 NORTH 50TH TERRACE  
KANSAS CITY, KANSAS  
913 289 5242  
ANSELL ENGINEERING CO  
816 THAYER AVE  
SILVER SPRING, MD  
301 588 4222  
CONTACT ASSOCIATES  
7 CYPRESS DRIVE  
BURLINGTON, MASS  
617 272 5051-2-3  
MURRAY A PERCIVAL CO  
22511 SOUTHFIELD ROAD  
SOUTHFIELD, MICH 48075  
313 356 5710  
WOOD CLEMONS CO  
6701 PENNSYLVANIA AVE SO.  
MINNEAPOLIS 23, MINN  
612 866 3401  
LOUIS E BRUNS CO  
514 PARKWOOD AVE  
KIRKWOOD, MISSOURI  
J P DEARIE CO  
P O BOX 66

MOUNTAIN LAKES, N J  
201 334 4848  
J B CLOUGH CO  
4614 PROSPECT AVE  
CLEVELAND, OHIO  
216 431 2700  
J B CLOUGH CO  
3035 PORTSMOUTH AVE  
CINCINNATI, OHIO  
513 321 0478  
HILLIARD ASSOCIATES  
766 OLD YORK ROAD  
JENKINTOWN, PENN  
215 884 6100  
WALTER N LASKA  
530 SIXTH AVE  
PITTSBURGH, PENN  
412 471 0490  
MORRIS SALISS  
P O BOX 464  
ROOSEVELT, PUERTO RICO  
PHIL J SCANLON CO  
P O BOX 70  
RICHARDSON, TEXAS 75081  
214 231 4661  
DWIGHT SMITH ASSOC  
32 SOUTH RIVER STREET  
AURORA, ILL 60504  
313 896 0828  
BILL WADDELL CO  
10211 N.E. 31ST PLACE  
BELLEVUE, WASH  
206 822 3660

#### ELECTRO-VOICE, INC

VP SALES  
LAWRENCE LEKASHMAN  
BRAND NAMES  
ARISTOCRAT R  
CARDLINE R  
ACOUSTIFOAM  
ACOUSTALLOY R  
CDP R  
SONOCASTER  
CV-D  
STEREON R  
FEATHERIDE R  
LINE RADIATOR  
SONOPHASE  
SOUND SPOT R  
MICHIGAN  
MUSICASTER  
RADAX  
PATRICIAN R  
POWER POINT  
SENTRY  
SUPER-SONAX  
VARIABLE-D R  
WOLVERINE R  
COMPANY ADDRESS  
638 CECIL STREET  
BUCHANAN, MICHIGAN 49107  
616 695 6831  
COMPANY REPRESENTATIVES  
EDWARD CAIN  
3258 CAHABA HEIGHTS ROAD  
BIRMINGHAM, ALABAMA 35243  
205 967 3080  
DICK BELLEW SALES COMPANY  
1005 WEST 4TH STREET  
EL OORADO, ARKANSAS  
501 UN 3 8325  
JACK CARTER  
DICK SCHNEPP  
2600 W OLIVE  
BURBANK, CALIFORNIA 91505  
213 843 3292  
MEYER, ROSS & FLEMING  
113 TENTH STREET  
SAN FRANCISCO, CALIFORNIA  
415 HE 1 0652  
MC LDUD & RAYMOND  
2151 S GRAPE STREET  
P O BOX 22044  
DENVER, COLORADO  
303 756 1589  
JOSEPH F HELLAUER, JR  
46 ROCKEFER AVENUE  
WEST HAVEN, CONNECTICUT 06516  
203 923 0261  
JACK SPROCH  
3520 W BROWARD BOULEVARD  
FT LAUDERDALE, FLA 33312  
305 587 3792  
MAITLAND K SMITH COMPANY  
31 16TH STREET, NW  
ATLANTA, GEORGIA 30309  
404 875 8031  
BILL KOLANS & COMPANY  
P O BOX 2098, 158 NOKAUEA  
HONOLULU, HAWAII  
811 628  
J D BOSWELL SALES  
25 PINE TRAIL  
CASEVILLE, ILLINOIS 62232  
314 GE 6 2042  
GENE CLEARS  
20200 ASHLAND AVE  
CHICAGO HEIGHTS, ILL  
312 755 0055  
HARRISON BLIND & ASSOCIATES  
1635 GENT STREET NORTH  
INDIANAPOLIS, INDIANA 46202  
317 ME 5 6291  
ELECTRONIC SALES CO  
1310 HERTZ DRIVE, SE  
CEDAR RAPIDS, IOWA 52403  
319 364 4342  
DICK BELLEW, JR  
5042 D ST, ANTHONY AVE  
NEW ORLEANS, LOUISIANA 70122  
504 282 9625  
DAVE BROTHERS  
6302 LINCOLN AVENUE  
BALTIMORE, MARYLAND  
301 RO 4 7189

JOE RADIMAK  
1808 GLEN RIDGE ROAD  
TOWSON, MARYLAND  
301 661 0713  
MICHAEL SCOTT & COMPANY  
336 WASHINGTON  
WELLESLEY HILLS, MASS  
617 CE 5 0102  
RICHARD FLORA  
294 HDNEY CREEK AVENUE  
ADA, MICHIGAN  
616 676 1854  
RILEY & PETCHELL  
ELECTRONIC SALES  
13209 FENKELL  
DETROIT, MICHIGAN  
313 VE 8 9100  
RAY RIPLEY & ASSOC  
6838 PILLSBURY AVE 50  
MINNEAPOLIS, MINNESOTA  
612 UN 6 8682  
CHARLES SMITH  
813 FORDHAM ROAD  
RIVERSIDE, NEW JERSEY  
609 HD 1 4581  
M & S ASSOCIATES - MILITARY  
P D BOX 185  
HADDANFIELD, NEW JERSEY  
609 HA 9 7055  
CARDUNER SALES CORPORATION  
P O BOX 900  
WESTBURY, NEW YORK  
516 333 8170  
GORDON LE ROY  
ORCHARD PARK  
PHELPS, NEW YORK  
315 548 4891  
JAMES SCHNITZER  
109 EASTON AVENUE  
BUFFALO, NEW YORK  
716 892 6551  
DAVID E COOM  
218 EAST LAKE ROAD  
DE RUYTER, NEW YORK  
315 852 3374  
JAMES CLYMER, JR  
1605 CHATHAM AVENUE  
CHARLOTTE, N CAROLINA  
704 FR 6 5951  
C L PUGH COMPANY  
2144 RIVERSIDE DRIVE  
COLUMBUS, OHIO 43221  
614 486 9678  
GEORGE CONNEEN  
131 HARNED ROAD  
SPRINGFIELD, DELAWARE CO, PA  
215 543 8641  
ELECTRO VOICE TENNESSEE  
RANKIN ROAD  
NEWPORT, TENNESSEE  
615 623 2356  
EDWARD MILLER  
SUITE 251, MELSHIRE BLDG  
1450 PRESTON FOREST SQUARE  
DALLAS, TEXAS 75230  
214 AD 9 3789  
HUGH PUTMAN  
914 WATEKAWAY  
RICHARDSON, TEXAS  
214 AD 1 4353  
JIM HANKOCK  
6022 WIGTON  
HOUSTON, TEXAS 77035  
713 PA 9 0824  
WM R LANPHEAR SALES  
4031 STONEYWAY AVE, NORTH  
SEATTLE, WASHINGTON 98103  
206 ME 3 4900  
REPS IN OTHER COUNTRIES  
ELECTRO TEC MARKETERS  
1624 W THIRD STREET  
VANCOUVER, B C  
604 RE 6 6377  
R C KAHNERT  
359 ENFORD ROAD  
RICHMOND HILLS, ONTARIO  
416 884 4574  
AURELE DES JARDINES  
P O BOX 885  
MONTREAL, QUEBEC  
514 677 5033

**THE ELMOR COMPANY**  
SALES MANAGER  
S. WEINER  
BRAND NAMES  
GALLET  
GALCO  
GUINANO  
SECURITY  
COMPANY ADDRESS  
29 E. MADISON ST  
CHICAGO, ILLINOIS

**ENCLOSURE CORP**  
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R. O. EOELMAN  
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1701 INDUSTRIAL BLVD.  
PENNSAUKEN, N. J. 08110  
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LEE ASSOCIATES  
8100 S MEMORIAL PARKWAY  
HUNTSVILLE, ALABAMA  
205 881 0461  
LEE ASSOCIATES  
200 E MARKS STREET  
ORLANDO, FLA  
305 241 4445  
LEE ASSOCIATES  
12250 WILKINS AVENUE  
ROCKVILLE, MARYLAND  
301 949 4800  
MECHANICAL MARKETING ENG  
20 CONGRESS AVENUE  
CHELSEA, MASSACHUSETTS

617 889 2279  
LEE ASSOCIATES  
432 WEST END BOULEVARD  
WINSTON-SALEM, NORTH CAROLINA  
919 724 2406  
C. E. SNOW  
613 CHELTENHAM AVENUE  
PHILADELPHIA, PENNSYLVANIA  
215 CA 4 2626

**ENGINEERING ASSOCIATES**  
COMPANY ADDRESS  
434 PATTERSON ROAD  
DAYTON, OHIO 45419  
OFC AX3-1662 LAB AX 3-1462

**ENGLISH ELECTRIC VALVE DIVISION**  
THE ENGLISH ELECTRIC CORP  
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ONE PARK AVE  
NEW YORK, N Y 10016  
DIRECT ALL INQUIRES  
45 INDICATED  
SOLE U S DISTRIBUTOR FOR  
IMAGE-ORTHICON & VIDICON  
CAMERA TUBES  
VISUAL ELECTRONICS CORP  
356 WEST 40TH ST  
NEW YORK, N Y 10018  
SOLE U S DISTRIBUTOR FOR  
VACUUM TUBES, TRANSMITTING  
CALVERT ELECTRONICS, INC  
220 EAST 23RD STREET  
NEW YORK, N Y 10010

**ENTRON, INC**  
SALES MANAGER  
JOHN RUSSELL  
COMPANY ADDRESS  
2141 INDUSTRIAL PKWY  
SILVER SPRING, MARYLAND 20904  
COMPANY REPRESENTATIVES  
PAUL MC INNISH  
231 B STOKES STREET  
HUNTSVILLE, ALABAMA 35805  
205 536 7259  
WILLIAM JONES  
3706 MONTGOMERY DRIVE  
SANTA ROSA, CALIF 95404  
RAY LA RUE  
ATLANTA, GEORGIA 30319  
404 634 4089  
WILLIAM SAILOR  
4983 HARBOR BOULEVARD  
COLUMBUS, OHIO 43227  
614 837 3259  
ROBERT TAYLOR  
P O BOX 1037  
RICHARDSON, TEXAS 75080  
214 AD 5 7472  
REPS IN OTHER COUNTRIES  
OMER GIRARD  
15 D ST PATRICE STREET  
MAGOG, QUEBEC

**ELECTRONIC MARKETING DIVISION**  
**ESSEX WIRE CORPORATION**  
SALES MANAGER  
DON ABERDEEN  
BRAND NAMES  
STANCOR  
RBM  
COMPANY ADDRESS  
3501 W. MADISON  
CHICAGO, ILLINOIS 60618  
463 7400  
SALES OFFICES  
444 CAMELBACK ROAD WEST  
PHOENIX, ARIZONA 85017  
602 264 3578  
112 GLASGOW AVENUE  
INGLEWOOD, CALIFORNIA 90301  
213 678 4711  
165 ELEVENTH STREET  
SAN FRANCISCO, CALIF 94103  
415 863 7880  
721 SOUTH BROADWAY  
DENVER, COLORADO 80209  
303 722 4641  
3308 14TH STREET, NW  
WASHINGTON, D C 20010  
202 265 3938  
1010 EXECUTIVE CENTER DRIVE  
ORLANDO, FLORIDA 32803  
305 241 5401  
3098 PIEDMONT ROAD, NE  
ATLANTA, GEORGIA 30305  
404 261 5838  
156 MOKAUEA  
HONOLULU, HAWAII 96803  
815 649  
309 AVONDALE DRIVE  
EAST PEORIA, ILLINOIS 61611  
309 699 3301  
349 NORTH ASHLAND AVENUE  
RIVER FOREST, ILLINOIS 60305  
312 261 0342  
1805 K AVENUE, NE  
CEDAR RAPIDS, IOWA 52402  
319 362 7825  
5450 BUENA VISTA DRIVE  
SHAWNEE MISSION, KANS 66205  
913 432 2131  
1812 BULLARD AVENUE  
METAIRIE, LOUISIANA 70003  
504 887 0482  
5500 HARFORD ROAD  
BALTIMORE, MARYLAND 21214  
301 254 3380  
336 WASHINGTON STREET  
WELLESLEY HILLS, MASS 02181  
617 235 0102  
23529 WOODWARD AVENUE  
FERNDALE, MICHIGAN 48220  
313 547 4771  
5364 KIMBALL AVENUE, SE

GRAND RAPIDS, MICHIGAN 49508  
616 243 7606  
3749 WEST BRADWAY  
MINNEAPOLIS, MINNESOTA 55422  
612 588 4663  
47 VILLAGE SQUARE  
HAZELWOOD, MISSOURI 63042  
314 838 6446  
2611 QUINCY STREET, NE  
ALBUQUERQUE, NEW MEX 87110  
505 265 1579  
496 ELLICOTT SQUARE BUILDING  
BUFFALO, NEW YDRK 14203  
716 854 2517  
311 MEACHAM AVENUE  
ELMONT, LI, NEW YORK 11003  
516 437 8150  
431 GREENWICH STREET-EXPORT  
NEW YORK, NEW YORK 10013  
212 966 2130  
6717 WOODSTOCK DRIVE  
CHARLOTTE, NO CAROLINA 28210  
704 523 3327  
150 EAST BROAD STREET  
COLUMBUS, OHIO 43215  
614 221 3363  
510 N W 19TH AVENUE  
P O BOX 2827  
PORTLAND, OREGON 97208  
503 226 4184  
1531 SPRUCE STREET  
PHILADELPHIA, PENN 19102  
215 545 1205  
106 NELBON AVENUE  
PITTSBURGH, PENN 15235  
412 241 7025  
560 S COOPER STREET  
MEMPHIS, TENNESSEE 38104  
901 276 4642  
2930 MERRELL ROAD  
DALLAS, TEXAS 75220  
214 357 4601  
4810 HAZARD  
HOUSTON, TEXAS 77006  
713 529 3811  
31 SOUTH THIRD, EAST  
SALT LAKE CITY, UTAH 84111  
801 364 4632  
422 FIRST AVENUE, WEST  
P O BOX 9285  
SEATTLE, WASHINGTON 98119  
206 284 1121  
928 EAST WISCONSIN AVENUE  
PEWAUKEE, WISCONSIN 53072  
414 691 0622

**EUPHONICS MARKETING**  
SALES MANAGER  
HOWARD SOUTHER  
BRAND NAMES  
MINICONIC  
COMPANY ADDRESS  
173 W. MADISON ST  
CHICAGO, ILLINOIS 60602

**E-Z-HOOK TEST PRODUCTS**  
SALES MANAGER  
ROBERT N YOUNGER  
BRAND NAMES  
E-Z-HOOK  
COMPANY ADDRESS  
1536 WOODBURN AVE  
COVINGTON, KY 41012  
COMPANY REPRESENTATIVES  
ASH M. WOOD CO.  
P O BOX 1158  
ARCADIA, CALIF.  
AT 7-0449 AND CU 3-1201  
ROYAL A. STEMM CO.  
662 IRVING PARK RD.  
CHICAGO, ILL.  
LA 5-8333  
REPS IN OTHER COUNTRIES  
LEN FINKLER LTD.  
2 TYCOS DRIVE  
TORONTO 19, ONTARIO  
416 781-5231

**FAIRCHILD RECORDING EQUIPMENT CORPORATION**  
SALES ADMINISTRATOR  
M. P. MCLAUGHLIN  
BRAND NAMES  
AUTO-TEN  
BALANCE/GARO  
TRANS/GARD  
BASS-X  
COMPATILIZER  
CONAX  
OYNALIZER  
INTEGRA  
LUMITEN  
LUMITE  
MT15  
REVERBERTRON  
COMPANY ADDRESS  
10-40 45TH AVENUE  
LONG ISLAND CITY, N Y 11101  
SALES REPRESENTATIVES  
WORLD WIDE PRODUCTS CO  
BOX 429  
N MIAMI BEACH, FLA  
LOREN GREEN ASSOCIATES  
5218 W OIVERSEY AVE  
CHICAGO, ILLINOIS  
MARTIN VOGT  
2817 BAMLET ROAD  
ROYAL OAK, MICHIGAN  
BEN JOSEPH ASSOCIATES  
BOX 486  
GREAT NECK, LI, NEW YORK  
H W SEAY COMPANY  
3850 FAIRLINGTON DR  
COLUMBUS, OHIO  
ANTLE SMITH SALES CO  
2721 BROOKFIELD AVE

DALLAS, TEXAS  
WILLIAM K WOOD CO  
5908 CALIFORNIA AVE  
SEATTLE, WASHINGTON

**THE FINNEY COMPANY**  
SALES MANAGER  
TOM PFEIFFER  
BRAND NAMES  
FINCO  
COMPANY ADDRESS  
34 W. INTERSTATE ST.  
BEDFORD, OHIO 44014

**F & M SYSTEMS CO, DIVISION OF FISCHBACH & MOORE, INC**  
MARKETING MANAGER  
M. C. BAIRD, JR.  
COMPANY ADDRESS  
2525 WALNUT HILL LANE  
DALLAS, TEXAS 75220  
COMPANY REPRESENTATIVES  
J MORRIS  
646 NORTH BEACHWOOD DRIVE,  
LOS ANGELES, CALIF 90004  
213 466 2151  
J DOUGLAS AND  
H ALSOP  
1019 22ND ST. N W  
WASHINGTON, D.C. 20037  
202 333-0800  
J LUTRELL  
2525 WALNUT HILL LANE  
DALLAS, TEXAS 75220  
214 CH 1 2121

**FISHER BERKELEY CORPORATION**  
SALES MANAGER  
RAPP BRUSH  
BRAND NAMES  
EXTACOM  
COMPANY ADDRESS  
1475 POWELL STREET  
EMERYVILLE, CALIF. 94608  
COMPANY REPRESENTATIVES  
ELLARD E STRASSNER CO  
3121 LOS FELIZ BLVD  
LOS ANGELES, CALIF  
213 666 1511  
JIM PIPER ASSOCIATES  
10 HAVEN ST  
DOVER, MASS  
617 449 1144  
CLARK R GIBB CO  
2400 HENNEPIN AVENUE  
MINNEAPOLIS, MINN  
612 FR 7 1200  
ROBERT FINLAY SALES CO  
45 NORTH BROAD ST  
RIDGWOOD, N J  
201 652 0088  
JOHN O OLSEN CO  
16201 SHAKER BLVD  
CLEVELAND, OHIO  
216 752 5444  
WILLIAM L METCALFE  
116 W FRANKLIN  
CENTERVILLE, OHIO 45459  
513 885 3722  
RICHARD A STONE  
1843 MAYDELL ST  
PITTSBURGH 16, PA  
412 341 8391  
TECHNO ASSOCIATES  
P O BOX 20544  
DALLAS, TEXAS  
214 FL 7 9213

**HERB FITZGERALD COMMUNICATIONS ELECTRONICS**  
SALES MANAGER  
HERB FITZGERALD  
COMPANY ADDRESS  
635 E. 185TH ST.  
CLEVELAND, OHIO 44119

**THE JAMES FLOYD FORD COMPANY**  
GENERAL MANAGER  
COMPANY ADDRESS  
JFFCO BUILDING P.O.DRW 839  
CAPE GIRARDEAU, MO. 63701  
314-334-6308  
COMPANY REPRESENTATIVES  
JAMES FLOYD FORD CO  
BOX 761  
CHICO, CALIFORNIA 95926

**FORT WORTH TOWER CO, INC**  
PRESIDENT  
T. W. MOORE  
COMPANY ADDRESS  
5201 BRIDGE ST PO BOX 8597  
FORT WORTH, TEXAS 76112  
817 536 5676  
COMPANY REPRESENTATIVES  
A C TILTON  
5201 BRIDGE ST  
FORT WORTH, TEXAS  
817 536 5676

**GAMMA SCIENTIFIC, INCORPORATED**  
SALES MANAGER  
HAROLD P. FIELD  
COMPANY ADDRESS  
5841 MISSION GORGE RO.  
SAN DIEGO, CALIF. 92120  
COMPANY REPRESENTATIVES  
GRIT ASSOCIATES  
3002 MIDVALE AVENUE  
LOS ANGELES, CALIF. 90034  
213 474-1587  
GRIT ASSOCIATES  
560 SAN ANTONIO ROAD  
PALO ALTO, CALIF. 94306  
415 327-3996



875 GREENTREE ROAD  
3 PARKWAY CENTER  
PITTSBURGH, PA. 15220  
412 921-8594  
1420 UNION AVENUE, ROOM 202  
MEMPHIS, TENN. 38104  
901 272-9641  
4447 N. CENTRAL EXPRESSWAY  
DALLAS, TEXAS 75205  
214 LA 1-1931  
CARRDILL AVE., P D BDX 4217  
LYNCHBURG, VA. 24501  
703 846-7311  
112 ANDOVER PARK EAST  
P D BDX 6100  
SEATTLE, WASH. 78051  
206 CH 4-7750  
615 EAST MICHIGAN STREET  
MILWAUKEE, WISC. 53202  
414 271-5000

GENERAL MICROWAVE CORPORATION

SALES MANAGER  
MOR WIND  
BRAND NAMES  
TFT  
COMPANY ADDRESS  
155 MARINE STREET  
FARMINGDALE, NEW YORK 11735  
COMPANY REPRESENTATIVES  
R F ASSOCIATES, INC  
1621 PONTIUS AVE  
LOS ANGELES, CALIF 90025  
213 478 1586  
BURLINGAME ASSOCIATES  
7 WELLINGTON ST  
WALTHAM, MASS 02154  
617 894 1955  
PALATINE ENG SALES, INC  
8587 ST CHARLES RDCK RD  
ST LOUIS, MO 63114  
314 126 7055  
BENNFWITZ ASSOCIATES  
8310 CUTLER, NE  
ALBUQUERQUE, N M 87110  
505 299 8651  
BERTRAM D AARDN & CO  
P D BOX 186  
ROSLYN, N Y 11576  
516 621 0630  
DOOLITTLE ELECTRONICS CORP  
P D BOX 97  
FAYETTEVILLE, N Y 13066  
315 637 3222  
SYLVAN GINSBURY, LTD  
72 W 45TH ST  
NEW YORK, N Y 10036  
212 MU 7 3213  
M J McDONALD CD  
ROUTE 1  
PFAFFTOWN, N C 27040  
919 924 2182  
ELECTRO SALES ASSOCIATES  
DABEL STATION, BDX 143  
DAYTON, OHIO 45420  
513 426 5551  
S & S ASSOCIATES  
BORD LINE ROAD  
KING OF PRUSSIA, PA 19406  
215 265 3450  
ARTHUR ENG SALES CO  
11216 W HALLORY AVE  
HALES CORNERS, WISC. 53130  
414 GA 5 5919  
REPS. IN OTHER COUNTRIES  
ELECTRODESIGN, LTD  
9124 ST LAWRENCE BLVD  
MONTREAL 11, QUEBEC  
514 389 5914

GENERAL RADIO COMPANY

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DURATRAK-R  
ORTHONULL-R  
STROBOTAC-R  
SYNCRONMETER-R  
VARIAC-R  
COMPANY ADDRESS  
22 BAKER AVENUE  
W. CONCORD, MASS. 01781

GENERAL TELEVISION NETWORK

SALES MANAGER  
R. RANDOLPH HIPPLER  
BRAND NAMES  
GIANTVIEW  
COMPANY ADDRESS  
901 LIVERNOIS  
FERNDALE, MICHIGAN 48220  
COMPANY REPRESENTATIVES  
JAN EDEN RECORDING & SOUND  
1440 N MERIDIAN ST  
INDIANAPOLIS, IND  
638 1337  
OHIO VALLEY SOUND  
20 E CEDAR  
EVANSVILLE, INDIANA  
425 6173  
AMERICAN SOUND SERVICE  
675 WEST THIRD  
COVINGTON, KENTUCKY  
261 9024  
BARNEY MILLERS INC  
232 E MAIN STREET  
LEXINGTON, KENTUCKY  
252 9622  
DOUGLAS TELEVISION CD  
3804 LEXINGTON RD  
LOUISVILLE, KY  
895 3500  
DOUGLAS TELEVISION CO  
11715 MAIN ST  
MIDDLETOWN, KY  
245 4444

AUDIO COMMUNICATIONS CO  
1191 WEINECKE ROAD  
SAGINAW, MICHIGAN  
793 1090  
AUDIO EQUIPMENT COMPANY  
15749 WYDMING AVE  
DETROIT, MICHIGAN  
864 1884  
CLARKE H JDY CD  
P D BDX 9695  
BAY VILLAGE, OHIO  
871 5900

GIBBS MANUFACTURING AND RESEARCH CORPORATION

VP SALES ENG  
R. E. MDWRIS  
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450 NORTH MAIN STREET  
JANESVILLE, WISCONSIN 53545  
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TECH-SOURCES UNLIMITED  
P O BOX 184  
BURBANK, CALIF  
213 849 6863  
JAMES F HURLBUT CO  
2240 SO ADAMS ST  
DENVER, COLO 80210  
303 756 2046  
JAMES B GUTTRIDGE  
2125 R STREET N W  
WASHINGTON, D C 20008  
202 667 2730  
REYNOLDS & ASSOC INC  
P D BOX 1043  
EAU GALIE, FLA  
305 254-0520  
M O & ASSOCIATES  
6713 N OLIPHANT AVE  
CHICAGO, ILL 60631  
312 774 8844  
EDWARDS ASSDC  
242 ST JOHNS AVE  
NEW MARKET, NEW JERSEY 08854  
201 752 2724  
ALDEN W SMITH  
PENURY PRIDRY  
DDYLESTOWN, PA  
215 348 4651  
R W MUREEN CD  
5523 DYER STREET  
DALLAS, TEXAS 75206  
214 361 0735  
CANE-JESSUP CO INC  
P O BOX 250  
BELLEVUE, WASH  
206 454 0691

J. W. GIBSON CO., INC.

SALES MANAGER  
DON A. OREAR  
BRAND NAMES  
MYSTIC  
DERREASER  
COMPANY ADDRESS  
1255 WINDSOR STREET  
INDIANAPOLIS, INDIANA

GOTHAM AUDIO CORPORATION

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BRAND NAMES  
EMT  
ELTRD  
BEYER  
DANNER  
GOTHAM  
KLEIN AND HUMMEL  
LYREC  
MULLER & WEIGER  
NEUMAN  
PREH  
STUDER  
TUCHEL  
COMPANY ADDRESS  
2 WEST 46TH STREET  
NEW YORK, N. Y. 10036  
212-265-4111  
COMPANY REPRESENTATIVES  
J-MAR ELECTRONICS, LTD  
2 THORNCLIFFE PARK DR  
TORONTO, 17, ONTARIO  
416 421 9080

GRADO LABORATORIES, INC  
COMPANY ADDRESS  
4614 SEVENTH AVENUE  
BROOKLYN, NEW YORK 11220

GRANTHAM SCHOOLS, INC.

PRESIDENT  
DONALD J. GRANTHAM  
COMPANY ADDRESS  
1505 N. WESTERN AVE.  
HOLLYWOOD, CALIF. 90027

GRAY RESEARCH & DEVELOPMENT CO.

SALES MANAGER  
HY LEHRMAN  
BRAND NAMES  
GRAY  
TELEJECTOR  
TELOP  
COMPANY ADDRESS  
P.O. BOX 296  
HARTFORD, CONN. 06101

GREENLEE TOOL COMPANY

SALES MANAGER  
MARTIN J. TUCKETT  
COMPANY ADDRESS  
2136 TWELFTH STREET  
ROCKFORD, ILLINOIS 61101

GREGORY AMPLIFIER CORP

SALES MANAGER  
ROBERT A CDHEN  
BRAND NAMES  
GREGORY  
BRYAN  
HANDI-AMP  
ADD-VERB  
COMPANY ADDRESS  
3650 DYRE AVE  
BRONX, N Y 10466  
COMPANY REPRESENTATIVES  
L H HARRIS  
204 E HILLSDALE BLVD  
SAN MATEO, CALIF  
415 341 2909  
GEO SMITH  
188 BREWSTER RD  
W HARTFORD, CONN  
203 523 0512  
LOREN F GREEN  
5218 W DIVERSEY AVE  
CHICAGO, ILLINOIS  
312 AV 6 6824  
ROBERT SMITH  
59 VERNDALE ST  
BROOKLINE, MASS  
617 277 0017  
KNAGGS-COLLINS-  
HAVERCAMP & HEMPE INC  
5818 N OAK TRAFFICWAY  
BDX 10719  
KANSAS CITY, MO  
816 GL 3 3203  
RDNNY SINGER  
102 SHDRE VIEW DR  
YONKERS, NEW YORK  
914 779 2221  
CARTWRIGHT & BEAN  
560 S COOPER ST  
MEMPHIS, TENN  
901 276 4442

GRINMAN FIXTURE COMPANY

SALES MANAGER  
JOHN F. GRINMAN  
BRAND NAMES  
GRINMAN  
COMPANY ADDRESS  
16041 GEORGETOWN ST. N.E.  
MINERVA, OHIO 44657

GULF ELECTRO-SALES, INC.

COMPANY ADDRESS  
7031 BURKETT STREET  
HOUSTON, TEXAS 77021

G-V CONTROLS INC.

VP-MARKETING  
GEORGE A. COMPTON  
BRAND NAMES  
G-V  
COMPANY ADDRESS  
101 OKNER PARKWAY  
LIVINGSTON, N.J. 07039  
COMPANY REPRESENTATIVES  
A. R. TICE  
13637 EAST BAILEY STREET  
WHITTIER, CALIF.  
213 696-4281  
EDWARD McMULLEN  
101 OKNER PARKWAY  
LIVINGSTON, N.J. 07039  
201 992-6200

HAMILTON HALL RESISTOR CORP

SALES MANAGER  
KENNETH DEGNAN  
BRAND NAMES  
HALL-OHM  
SERV-OHM  
HALL-RITE  
COMPANY ADDRESS  
227 N. WATER STREET  
MILWAUKEE, WISCONSIN 53202  
COMPANY REPRESENTATIVES  
FEATHERSTONE SALES CD  
1355 MARKET ST  
SAN FRANCISCO, CALIF  
KL 2 2311  
HENRY FELDMAN CO  
P D BDX 66367  
LOS ANGELES 66, CALIF  
RT 9 8803  
KOETHER-COX CD  
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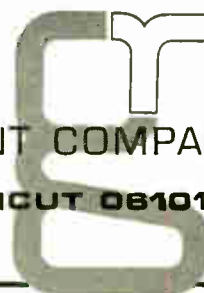
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## SUPER-η LINES FOR VIDEO SYSTEMS

**Impedance:** 75 ohms (unless otherwise specified)  
**Amplitude Response:** better than 0.1 db. flatness to 10 MHz or higher  
**Ripple:** within  $\pm .05$  db to 10 MHz or higher  
**Group Delay:** linear within  $\pm 1\%$  or  $\pm$  Insec, whichever is greater.  
**Group Delay Ripple:** within  $\pm 2\frac{1}{2}\%$  to 14 MHz  
**K factor:** better than .25% for T or  $2T \sin^2$  pulse for both American and European systems  
**Cross talk:** less than 46 db.

**UPDATE YOUR VIDEO BROADCAST EQUIPMENT WITH KAPPA SUPER-η DELAY LINES!**

**Specify KAPPA for the most complete line of electro-magnetic delay lines...**

### STANDARD LUMPED CONSTANT DELAY LINES SERIES LC



Delay: 50 Nanoseconds to 1 second  
 Bandwidth: DC to 250 MHz  
 Rise Time: As low as 2 Nanoseconds  
 Impedance: 25 ohms to 50 K ohms

### TRANSPONDER LINES SERIES C



Tap Spacing: 1.45  $\mu$ sec, or as required  
 Tap Tolerance:  $\pm .05$ , or as required  
 Delay-to-Rise-Time Ratio: 100 max.  
 Temperature Stability: 50 ppm  $^{\circ}$ C or less

### LOW DISTORTION LINES SERIES D



Distortion at Output: 2% max.  
 Distortion at Taps: Less than 5% at any tap  
 Distortion Limit: As low as 0.1% if required  
 Delay Range: up to 100 usec.

### PRECISION AUDIO DELAY LINES SERIES A



Delay Range: from 500  $\mu$ sec to 1 sec.  
 Bandwidth: 70 KHZ (max.)  
 Delay Linearity: nominally within  $\pm 0.25\%$  available to within  $\pm 0.05\%$

### PRECISION DECADE DELAY UNITS SERIES DK



Variable delays available between input and output terminals in decade steps. Each decade has eleven (11) switch contacts and ten (10) delay increments so that the dial values overlap.

### ULTRA MINIATURE DELAY LINES SERIES T



Delay Range: to 200nsec.  
 Delay/Rise Time: 10 max.  
 Attenuation: 2 db max.  
 Fully encapsulated

### STANDARD DISTRIBUTED CONSTANT DELAY LINES SERIES DC



Delay Range: to 3  $\mu$ sec.  
 Standard Tolerance:  $\pm 5\%$  on Delay  
 Delay-to-Rise-Time Ratio: 11 max.  
 Distortion:  $\pm 5\%$  (typical),  $\pm 10\%$  max.

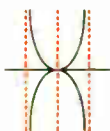
### DELAY TRIMMERS: TINY TRIM\* SERIES



Size: 1/4 Cubic Inch

| PART NUMBER | SHIFT RANGE @ 3.58 MHZ DEG. | DELAY (Nano-sec.) | RISE TIME (Nano-sec.) | IMPEDANCE (ohms) |
|-------------|-----------------------------|-------------------|-----------------------|------------------|
|             |                             |                   |                       |                  |
| TT20D       | 25                          | 20                | 5                     | 500              |
| TT30C       | 38                          | 30                | 7.5                   | 390              |
| TT40D       | 50                          | 40                | 10                    | 500              |
| TT50C       | 64                          | 50                | 12.5                  | 390              |
| TT60C       | 75                          | 60                | 15                    | 330              |

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614 486-9678  
C. L. PUGH CO.  
2144 RIVERSIDE DR.  
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614 486-9678  
A-E-PETSCHKE CO.  
807 E. ABRAMS STREET  
ARLINGTON, TEXAS  
817 277-1379

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OL 7-6659  
PASTON-HUNTER CO., INC.  
2002 TEALL AVE  
SYRACUSE, N. Y.  
437-2992  
F. OHMAN  
BOX 363  
TWINSBURG, OHIO  
216-425-7445

# VIDEO TEST TERMINATIONS



Type PL 259

Type N

Type BNC

HOLLAND ELECTRONICS Precision Test Terminations provide a simple, convenient method for accurately terminating pulse, video and RF coaxial cables. These terminations eliminate undesirable reflections and provide an easily accessible test terminal for checking waveform and level.

The terminating elements are low noise 1% metal film resistors and can be supplied in any value required.

## TEST TERMINATION PLUGS



Tip Jack

Front View

Solder Lug

HOLLAND ELECTRONICS Coaxial Test Termination Plugs are designed for use in Pulse, Video and RF patching systems. These terminations provide a means of properly terminating a line in its characteristic impedance and in addition have access to the center conductor for examination of signal under terminated conditions.

Plugs contain a 1/2W, 1% tolerance low noise resistor. All contact surfaces are heavy gold plated. Choice of test terminal between solder lug or pin tip jack (for 0.080 dia. test probes) color coded, Green 50 ohms, Violet 75 ohms, White 93 ohms. Plugs are compatible with RCA or W.E. patching systems.

## FIXED PAD ATTENUATORS



Type AUHF

Type AN

Type ABNC

HOLLAND ELECTRONICS Fixed Pad Attenuators are precision coaxial assemblies designed for use in pulse, video and RF circuits. Fully enclosed ruggedized metal construction provides shielding and protects the low noise 1% tolerance metal film resistors used in the attenuation networks. Careful design assures good high frequency response to 250 megacycles.

Attenuators are available in any desired db value from 1 through 60 db in 1 db steps. Standard impedances are 50, 75 and 93 ohms. Standard connectors are UHF, N and BNC. Type UHF and BNC attenuators are rated at 1/2 watt; type N at 1 watt. Special units can be supplied with any impedance or attenuation, multiple outputs, different input and output connectors, type TNC and C connectors, test terminals, etc. Impedance matching attenuators are also available.

# HOLLAND ELECTRONICS, INC.

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C H MITCHELL CO  
18531 VENTURA BLVD  
TARZANA, CALIF  
881 2626  
JOHN ANDERSON CO., INC  
5231 HUMBOLT AVE  
SO MINNEAPOLIS, MINN  
612 823 6459  
H A ROSS & CO  
260 S CHERRY  
KANSAS CITY, MO  
816 221 0866  
ED BRADDOCK  
BOX 305  
HADDONFIELD, N. J.  
609 429 0087  
CHESTER DREXLER  
3 LEE DRIVE  
SO FARMINGDALE, L.I. N.Y.  
516 249 8206  
OHIO ASSOC  
BOX 728  
LIMA, OHIO  
VAUGHNSVILLE 6500  
WYBORNY SALES CO  
BOX 17070  
DALLAS, TEXAS  
214 381 4645  
DON KOHLER  
11532 4TH AVE NE  
SEATTLE, WASHINGTON  
206 363 1439

KRS INSTRUMENTSDIV OF DATAPIPSE, INC

SALES MANAGER  
JAMES S. JOHNSON  
BRAND NAMES  
STACT  
STACTAPE  
COMPANY ADDRESS  
1313 N. LINCOLN AVE.  
PASADENA, CALIF. 91103  
213 601 7416  
TWX 910 588 3282  
COMPANY REPRESENTATIVES  
W A BROWN & ASSOCIATES, INC  
1314 BUFORD STREET, N W  
HUNTSVILLE, ALABAMA 25801  
HYTRONIC MEASUREMENTS  
1017 N THIRD ST  
PHOENIX, ARIZONA 85004  
THE THORSEN COMPANY  
6824 MELROSE AVENUE  
LOS ANGELES, CALIF. 90038  
HYTRONIC MEASUREMENTS, INC  
1295 SOUTH BANNOCK STREET  
DENVER, COLORADO 80223  
INSTRUMENT CONSULTANTS, INC  
2381 WHITNEY AVENUE  
HAMDEN, CONN 06518  
W A BROWN & ASSOCIATES, INC  
222 WEBER AVENUE  
ORLANDO, FLORIDA 32803  
W A BROWN & ASSOCIATES  
3039 NE 32ND AVE  
FORT LAUDERDALE, FLA 33308  
RIDGWAY ASSOCIATES, INC  
3759 N HARLEM AVENUE  
CHICAGO, ILLINOIS 60634  
LEEMARK ASSOCIATES, INC  
4518 WEST 89TH STREET  
PRAIRIE VILLAGE, KAN. 66207  
WITCO ELECTRONICS  
3919 WILLOW DR  
WICHITA, KANSAS  
BRIMBERG ASSOCIATES, INC  
110 E PENNSYLVANIA AVE  
TOWSON, MD. 21204  
BRIMBERG ASSOCIATES, INC  
814 THAYER AVENUE  
SILVER SPRINGS, MO. 20910  
INSTRUMENT CONSULTANTS, INC  
P O BOX 25  
WABAN, MASS. 02168  
RIDGWAY ASSOCIATES, INC  
7720 MORGAN AVENUE SOUTH  
MINNEAPOLIS, MINN 55423  
LEEMARK ASSOCIATES, INC  
2001 BI BENO BLVD  
ST LOUIS, MO. 63117  
WITKO ELECTRONICS  
P O BOX 125  
FAIRBURY, NEBRASKA  
DATA REP ASSOCIATES  
P O BOX 645  
RIDGWOOD, N J 07451  
HYTRONIC MEASUREMENTS, INC  
205 SAN PABLO, S E  
ALBUQUERQUE, N M 87108  
J D RYERSON ASSOCIATES, INC  
P O BOX 1400  
SYRACUSE, N Y 13201  
DATA REP ASSOCIATES  
BOX 164, HUNTINGTON STATION  
HUNTINGTON, L I, N Y  
W A BROWN ASSOCIATES, INC  
440 WEST-END BLVD  
WINSTON-SALEM, N.C. 27101  
RIDGWAY ASSOCIATES, INC  
22811 LORAIN ROAD  
FAIRVIEW PARK, OHIO  
RIDGWAY ASSOCIATES, INC  
2400 E DOROTHY LANE  
DAYTON, OHIO 45420  
DATA REP ASSOCIATES  
BOX 349  
NORRISTOWN, PENN  
WITKO INC  
435 BRANIFF BUILDING  
DALLAS, TEXAS  
AIREP ELECTRONICS, INC  
P O BOX 36211  
HOUSTON, TEXAS 77036  
AIREP ELECTRONICS, INC  
P O BOX 9555  
DALLAS, TEXAS 75214  
HYTRONIC MEASUREMENTS, INC  
2022 SOUTH MAIN STREET  
SALT LAKE CITY, UTAH 84115  
W A BROWN & ASSOCIATES, INC  
325 FIRST STREET  
ALEXANDRIA, VA 22314  
THE THORSEN COMPANY  
1767 15TH AVENUE SOUTH  
SEATTLE, WASH 98144  
REPS. IN OTHER COUNTRIES  
DELTA EQUIPMENT S A  
28 RUE DE TABELLION  
BRUXELLES 5, BELGIUM  
OMNI RAY GMBH  
NYMPHENBURGER STRASSE 164  
MUNICH 19, WEST GERMANY  
ENVIRONMENTAL EQUIPMENTS, LTO  
STATION YARO  
WOKINGHAM, BERKS, ENGLAND  
GENERAL TEST INSTRUMENTS, LTD  
GLOUCESTER TRADING ESTATE  
HUCKLECOTE, GLOUCESTER, ENG.  
MEL SALES LIMITED  
71 CROCKFORD BLVD  
SCARBOROUGH, ONTARIO  
MEL SALES LIMITED  
P O BOX 1352, POSTAL STA. O  
MONTREAL, QUEBEC  
SIMON GRAY PTY LTO  
28 ELIZABETH STREET  
MELBOURNE, CI, AUSTRALIA



**LACROSSE ELECTRONICS, INC.**  
SALES MANAGER  
KIT VAIL  
COMPANY ADDRESS  
P.O. BOX 102  
LACROSSE, WISCONSIN 54601  
782-6042

**LAFAYETTE RADIO ELECTRONICS**  
SALES MANAGER  
J. RUSSELL  
BRAND NAMES  
ARGONNE-R  
COMPANY ADDRESS  
111 JERICHO TURNPIKE  
SYDSEY, L.I. • N. Y. 11791

**LAKE ELECTRONICS, INC.**  
VICE PRESIDENT-MARKETING  
R. J. TANCZOS  
BRAND NAMES  
LAKE-GERHARD  
COMPANY ADDRESS  
3311 PERKINS AVENUE  
CLEVELAND, OHIO 44114  
216 431 6212

**LAMPKIN LABORATORIES INC.**  
SALES MANAGER  
DAVID A. BOYERS  
COMPANY ADDRESS  
BRADENTON, FLORIDA 33505

**LANG ELECTRONICS, INC.**  
COMPANY ADDRESS  
507 FIFTH AVE  
NEW YORK, NEW YORK 10017

**LANGEVIN, DIVISION SCIENTIFIC INDUSTRIES, INC.**  
SALES MANAGER  
JOHN SWANSON  
BRAND NAMES  
LANGEVIN  
COMPANY ADDRESS  
1801 E. CARNEGIE AVE.  
SANTA ANA, CALIF. 92705  
546-8830  
COMPANY REPRESENTATIVES  
KOESSLER SALES CO  
818 NORTH FAIRFAX AVE  
LOS ANGELES, CALIF  
213 OL 3 1605  
RON BOWEN & ASSOC  
721 SOUTH BROADWAY  
DENVER 9, COLO.  
303 SH 4 2501  
J E JOYNER ASSOCIATES  
P O BOX 10821 STA A  
868 YORK AVE, SW  
ATLANTA, GA 30310  
404 758 7496  
IRVING W. ROSE ASSOC  
4734 N. AUSTIN AVE  
CHICAGO, ILL  
312 AV 2 8835  
GENE ROSEN & ASSOC  
9501 WADSWORTH DRIVE  
BETHESDA, MARYLAND  
301 365 5113  
TECH REP ASSOC  
BOX 161, 17 ANDREW ROAD  
TOPSFIELD, MASS  
617 887 8671  
RILEY & PETCHELL ELECT SALES  
13209 FENKELL  
DETROIT 27, MICH.  
313 VE 8 9100  
SMITH-MEKER ENGINEERING CO  
157 CHAMBERS ST  
NEW YORK, NEW YORK  
212 W 4 5510  
THE M. SIMONS & SON CO., INC  
EXPORT  
150 BROADWAY  
NEW YORK, N. Y.  
212 BA 7-5513  
SCHROEDER SALES CO  
2254 EUCLID AVE  
CLEVELAND, OHIO  
216 MA 1 5075  
HAYS COMPANY  
BOX E, 405 N. BOWSER  
RICHARDSON, TEXAS  
214 AD 1 1426  
WILLIAM R. LANPHEAR CO  
4031 STONEMAN NORTH  
SEATTLE, WASH  
206 ME 3 4900  
REPS. IN OTHER COUNTRIES  
E. J. PIGGOTT ENTERPRISES  
274 CHURCH STREET  
TORONTO, ONTARIO  
416 363 9141

**LANE ELECTRONICS, INC.**  
SALES MANAGER  
DAVID A. BOYERS  
COMPANY ADDRESS  
BRADENTON, FLORIDA 33505

**JAMES B. LANING SOUND CO.**  
BRAND NAMES  
JBL  
COMPANY ADDRESS  
3249 CASITAS AVE.  
LOS ANGELES, CALIF. 90039

**LAVIOLETTE ELECTRONICS**  
SALES MANAGER  
DORIS A. LAVIOLETTE  
COMPANY ADDRESS  
26077 FARMFIELD ROAD  
CALABASAS, CALIF. 91302

**LENKURT ELECTRIC CO INC.**  
SALES MANAGER  
JAY NAUGLE  
BRAND NAMES  
AGAMP  
DATATEL  
LENKURT

**MICROTEL**  
MOBILETEL  
COMPANY ADDRESS  
1105 COUNTY ROAD  
SAN CARLOS, CALIFORNIA 94070  
591 8461  
COMPANY REPRESENTATIVES  
KEN K. HIGGINS  
LENKURT ELECTRIC CO., INC  
845 THIRD AVE 12TH FLOOR  
NEW YORK, N.Y. 10022  
355 1507  
M. C. ROYALTY  
LENKURT ELECTRIC CO., INC  
340 NORTHCREST BLDG  
8609 NORTHWEST PLAZA DR  
DALLAS, TEXAS 75225  
363 0286

**LENZ ELECTRIC MANUFACTURING COMPANY**  
SALES MANAGER  
R. G. ZENDER  
COMPANY ADDRESS  
1751 NORTH WESTERN AVE.  
CHICAGO, ILLINOIS 60647  
COMPANY REPRESENTATIVES  
R. HALES PRIDMORE & ASSOC  
1225 E NORTHVIEW AVE  
PHOENIX, ARIZONA  
944 9631  
PENWARDEN ASSOC, INC  
14547 TITUS ST  
VAN NUYS, CALIF  
ST 2-4920  
WINCO CORP  
257 CASTRO ST  
P O BOX 881  
MOUNTAIN VIEW, CALIF  
961 8510  
MEL FOSTER CO., INC  
228 SO CEDAR LAKE ROAD  
MINNEAPOLIS, MINN  
374 2612  
NORMAN W. KATHRINUS & CO  
2427 BRENTWOOD BLVD  
ST LOUIS, MISSOURI  
WO 2 5627  
MCFADDEN SALES CO  
150 EAST BROAD ST  
COLUMBUS, OHIO  
221 3363  
DANCO CORP  
GERMANTOWN PIKE &  
QUARRY HALL ROAD  
FAIRVIEW VILLAGE, PA  
CH 8 1619  
CAMPION SALES CO  
9002 CHANCELLOR ROW  
DALLAS, TEXAS 75207  
ME 1 3390

**LEWIS AND KAUFMAN LTD.**  
DIRECTOR OF MARKETING  
CHARLES A. TEPPER  
BRAND NAMES  
LEWIS & KAUFMAN  
L & K  
COMPANY ADDRESS  
107 TRUMBULL STREET  
ELIZABETH, NEW JERSEY 07206

**LIBERTY TOWER MFG CO.**  
SALES MANAGER  
B. J. GRIFFITH  
COMPANY ADDRESS  
RT 45 NORTH, BOX 161  
EFFINGHAM, ILLINOIS  
COMPANY REPRESENTATIVES  
GLEN GRIFFITH  
DIETERICH, ILL  
925 3032  
E. A. MARTEN  
EFFINGHAM, ILL  
342 2835  
A. D. GRIFFITH  
EFFINGHAM, ILL  
342 2835  
B. J. GRIFFITH  
EFFINGHAM, ILL.  
342-2835  
BILLY GRIFFITH  
8900 N. E. 51ST  
OKLAHOMA CITY, OKLA  
PR 1 3749  
ART GRIFFITH  
7900 S SHIELDS  
OKLAHOMA CITY, OKLA  
ME 4 8779

**LIGHTING & ELECTRONICS INC.**  
SALES MANAGER  
N. J. SONNENFELD  
COMPANY ADDRESS  
423 SOUTH BROADWAY  
YONKERS, NEW YORK 10705  
COMPANY REPRESENTATIVES  
R C LURIE COMPANY  
4718 N 35TH PARKWAY  
PHOENIX 14, ARIZONA  
602 264 5904  
CALIFORNIA LIGHTING SALES  
3035 WEST 7TH ST  
LOS ANGELES 5, CALIF  
213 388 3176  
DESCO  
6232 EEL COURT  
N HIGHLANDS, CALIF  
916 331 5249  
GREGG N CLOUDS CO  
977 JACKSON ST  
DENVER, COLORADO 80206  
303 355 0660  
WYMAN/YOUNG ASSOC  
6 PRATT STREET  
ROCKY HILL, CONN 06067

203 529 2019  
K. DALE RHODES  
333 N. OCEAN BLVD  
DEERFIELD BEACH, FLORIDA  
305 399 7389  
DON REIMAN & ASSOC  
419 NORTH AVE., N. E.  
ATLANTA, GEORGIA 30305  
404 231 1972  
VERN WINN  
1121 LONGWOOD CIRCLE  
LOUISVILLE, KY 40223  
502 899 9940  
GREGORY-SALISBURY & CO INC  
805 S FRONT STREET  
NEW ORLEANS, LA 70130  
504 524 5207  
GREGORY-SALISBURY & CO INC  
P O BOX 1126  
BATON ROUGE, LA 70003  
504 342 2873  
RICHARD B MURDOCH  
7300 BAYLOR AVE  
COLLEGE PARK, MD 20741  
301 GR 4 5790  
WYMAN/YOUNG ASSOCIATES  
128 ORCHARDVIEW AVE  
WEST SPRINGFIELD, MASS 01089  
413 739 2631  
GERALD FINN  
4892 FULLER AVE S E  
GRAND RAPIDS, MICHIGAN 48211  
616 534 8327  
LIGHTING ASSOCIATES  
1961 E MILWAUKEE AVE  
DETROIT, MICH 48211  
313 875 2757  
GREGORY-SALISBURY CO INC  
350 N MART PLAZA, BOX 9767  
JACKSON, MISS 39026  
601 EM 2 1671  
P M ERWIN ASSOCIATES  
3738 WASHINGTON BLVD  
ST LOUIS 8, MO  
314 JE 5 8651  
TED STUART  
47 DARTMOUTH DRIVE  
DELTRAN, NEW JERSEY  
609 HD 1 6875  
WILLIAM MAY & ASSOCIATES  
57 FIRST STREET  
PEQUANOCK, N J 07440  
201 656 2578  
RUSSELL ERICSSON AGENCY  
1100 ALVARADO DRIVE NE  
ALBUQUERQUE, NEW MEXICO  
505 242 9589  
HEADQUARTERS  
423 SOUTH BROADWAY  
YONKERS, NEW YORK 10705  
914 965 7050  
WARREN A BRENNAN  
15 PIERPORT DRIVE  
WILLIAMSVILLE, N Y 08075  
716 633 8225  
FRANK SWEENEY AGENCY  
225 WIN HILLS DRIVE  
SYRACUSE, N Y 14221  
315 475 0662  
S L BAGBY CO  
322 W MOREHEAD ST  
CHARLOTTE 1, N CAROLINA  
704 334 2821  
WARREN LEHR ASSOC, INC  
1890 NORTHWEST BLVD  
COLUMBUS, OHIO 43212  
614 488 5939  
ROBERT EIMS ASSOC  
224 N E 61ST STREET  
OKLAHOMA CITY, OKLA  
405 VJ 3 0874  
M B MOORE, JR & ASSOC  
BOX 463  
MYRTLE BEACH, S C 29577  
803 449 5881  
GREGORY-SALISBURY & CO INC  
P O BOX 6166  
MEMPHIS, TENN 38106  
901 948 0496  
W J CHILDERS  
5811 MALETTO LANE  
DALLAS, TEXAS 75230  
214 AD 9 3684  
MICHAEL PRICE  
BOX 222  
N SALT LAKE CITY, UTAH 84110  
801 295 3435  
LYNN H MORRIS  
452 HIGH STREET BOX 349  
SALEM, VIRGINIA 24153  
703 389 5798

**LINDSAY SPECIALTY PRODUCTS LTD.**  
BRAND NAMES  
LINDSAY  
COMPANY ADDRESS  
50 MARY ST. W  
LINDSAY, ONTARIO

**LIPPS INC.**  
VICE PRESIDENT - SALES  
BERNARD D. LIPPS  
BRAND NAMES  
LIPPS, INC  
COMPANY ADDRESS  
1630 EUCLID STREET  
SANTA MONICA, CALIF. 90404  
393-0449  
COMPANY REPRESENTATIVES  
WILLIAM F. LANGLEY  
8219 RHEA AVE  
NORTHBRIDGE, CALIF  
349-6694

**LITTELFUSE INC.**  
VICE PRES & SALES MANAGER

WALTER A. CLEMENTS  
BRAND NAMES  
MICROFUSE  
PICDFUSE  
SLD-BLO  
COMPANY ADDRESS  
800 E NORTHWEST HWY  
DESPAINES, ILL 60016  
312 824-1188  
COMPANY REPRESENTATIVES  
HARRY MOORE SALES CO  
4142 N 18TH  
PHOENIX, ARIZONA  
602 274 0060  
WM. J. PURDY CO.  
312 7TH STREET  
SAN FRANCISCO, CALIF.  
415 863 3300  
JACK BERMAN CO., INC.  
1751 S. LA CIENEGA  
LOS ANGELES, CALIF.  
213 870 4711  
MCLOUD & RAYMOND COMPANY  
2151 S. GRAPE  
DENVER, COLORADO  
303 756 1589  
FRANK C. NICKERSON CO  
1244 CLAIRMONT, STE 220  
DECATUR, GEORGIA  
404 636-2752  
RILL KOLANS & COMPANY  
P.O. BOX 2098  
HONOLULU, HAWAII 96805  
811 628  
MARAL SALES CORP  
5787 N LINCOLN  
CHICAGO, ILL 60645  
312 561 7290  
CRESCENT INTERNATIONAL  
540 N. LAKE SHORE  
CHICAGO, ILLINOIS  
312 337 2292  
DEVUE ASSOCIATES  
4010 WASHINGTON BLVD.  
INDIANAPOLIS, IND.  
317 283 1395  
THOMAS-MODRIN ASSOC., INC.  
P.O. BOX 189  
SHAWNEE MISSION, KANSAS  
913 432 2131  
CHARLES SEGAL CO.  
799 WASHINGTON  
NEWTONVILLE, MASS.  
617 969 6900  
R. C. MERCHANT & CO., INC.  
18411 W. MCNICHOLES  
DETROIT, MICH.  
313 535 6000  
NORTHERN STATE SALES CO  
1109 W 78 1/2 ST  
MINNEAPOLIS, MINNESOTA  
612 333-2431  
BRESSLER ASSOCIATES  
4808 BERGENLINE  
UNION CITY, N.J.  
201 864 9577  
R. W. MITSCHEG CO., INC  
496 ELLICOTT SQ BLDG  
BUFFALO, N.Y.  
716 854 2517  
NEAL BEAR CORPORATION  
3435 STREETSBOBO  
WEST RICHFIELD, OHIO  
216 659 3331  
JOSEPH V. BELUSKO CO.  
2355 N.W. QUIMBY  
PORTLAND, OREGON  
503 222 4279  
NEBCO ASSOCIATES  
1974 GREGORY AVENUE  
MONROEVILLE, PA.  
412 824-2111  
SAMUEL W. JEFFRIES, INC.  
105 FORREST  
MARBERTH, PA.  
215 664 8500  
AL ENGELMAN CO.  
P.O. BOX 12091  
MEMPHIS, TENN.  
901 458 6263  
LUND & COMPANY  
2215 N. OLIVE STREET  
DALLAS, TEXAS  
214 748 8839  
REPS. IN OTHER COUNTRIES  
PITT PRODUCTS, LTD.  
87 MINGOLD AVENUE  
TORONTO, ONT.  
416 789 2621

**LITTLE JOE ENTERPRISES**  
SALES MANAGER  
ROBERT D. SIDWELL  
COMPANY ADDRESS  
400 3RD STREET  
PORT ST. JOE, FLORIDA  
COMPANY REPRESENTATIVES  
JAMES H. VICKERS  
P.O. BOX 40  
PORT ST. JOE, FLORIDA  
229 3866

**LITTON EDUCATIONAL TELEVISION DIVISION**  
VICE PRESIDENT  
HENRY SHAPIRO  
COMPANY ADDRESS  
210 WESTCHESTER AVENUE  
WHITE PLAINS, NEW YORK 10604

**LOW POWER BROADCAST EQUIPMENT COMPANY**  
SALES MANAGER  
RICHARD H CROMPTON  
COMPANY ADDRESS

248 SWEDSFORD ROAD  
MALVERN, PA 19355  
215 NI 4-4096

**MACARTA INC.**  
SALES MANAGER  
G. O. ANDREWS  
BRAND NAMES  
CAROUSEL  
ROTA RAK  
MACARTA  
COMPANY ADDRESS  
709 RAILROAD AVE.  
WEST DES MOINES, IOWA 50265

**THE MACHELETT LABORATORIES, INC.**  
A SUBSIDIARY OF RAYTHEON CO.  
SALES MANAGER LG POWER TUBES  
E. H. GILBERT  
COMPANY ADDRESS  
1063 HOPE STREET  
SPRINGDALE, CONN. 06879  
COMPANY REPRESENTATIVES  
K G MORRISON  
120 FL CAMINO REAL  
SAN CARLOS, CALIFORNIA 94070  
415 593 1021  
R A HOFFMAN  
2501 W 7TH STREET  
LOS ANGELES, CALIFORNIA 90057  
213 383 1277  
D S FRANKEL  
BOYCE BUILDING RM 1022  
510 ND DEARBORN STREET  
CHICAGO, ILLINOIS 60610  
312 642 5316

**MACKENZIE LABORATORIES**  
SALES MANAGER  
A. R. TAYLOR  
COMPANY ADDRESS  
1357 N FAIR OAKS AVE  
PASADENA, CALIF 91103  
213 5Y 8 6220

**MAGNA-TECH CORPORATION**  
SALES MANAGER  
RON MATTHEWS  
BRAND NAMES  
MAGNA-TECH  
COMPANY ADDRESS  
2300 AMPEX AVENUE  
OPELIKA, ALA 36801  
205 745 7346

**MAGNECORD**  
DIVISION OF THE TELEX CORP.  
MARKETING MANAGER  
JAMES S ARRINGTON  
BRAND NAMES  
MAGNECORD  
COMPANY ADDRESS  
9600 ALDRICH AVE. SOUTH  
MINNEAPOLIS, MINN. 55420  
COMPANY REPRESENTATIVES  
MAITLAND K. SMITH CO.  
3258 CHABARA RD.  
BIRMINGHAM, ALA. 35243  
205 967-3080  
KOESSLER SALES COMPANY  
4614 NDRTH SEVENTH STREET  
PHOENIX, ARIZONA 85014  
DICK BELLEW SALES CO.  
1005 W 4TH STREET  
EL DORADO, ARKANSAS  
501 863-8325  
KOESSLER SALES CO.  
818 N FAIRFAX AVENUE  
LOS ANGELES, CALIF.  
213 653-1605  
EVANS MARKETING COMPANY  
2803 GENEVA AVENUE  
DALY CITY, CALIF.  
415 584-0818  
JOHN A ROWE & ASSOCIATES  
58TH & WALLEY HWY.  
DENVER, COLO. 80216  
303 623-3030  
MAITLAND K. SMITH CO.  
1850 E DAYTON ST. CIRCLE  
FT. LAUDERDALE, FLA.  
305 587-7378  
MAITLAND K SMITH COMPANY  
31-16TH STREET, N W  
ATLANTA, GA. 30309  
A H PETERSON CO.  
3647 W 62ND ST.  
CHICAGO, ILL.  
312 735-0846  
ZIMMER SALES, INC.  
5620 WOODWARD  
MERRIAM, KANSAS  
913 432-8900  
BROTHERS & CONNEEN ASSOCIATE:  
6302 LINCOLN AVENUE  
BALTIMORE, MD. 21209  
301 RO 4-7189  
HETHERINGTON SALES CO.  
97 BOGEL STREET  
WESTON 93, MASS.  
617 235-5323  
HETHERINGTON SALES CO.  
100 HATHERLY ROAD  
WALTHAM, MASS.  
617 894-4849  
RILEY & PETCHELL ELECTRONIC  
13209 FENKELL AVENUE  
TROY, MICH.  
313 835-0000  
MARTY BETTAN SALES CO.  
77-15 164TH AVENUE  
FLUSHING, N. Y. 11366  
212 657-6659

WAXMAN CURRANT SALES, INC.  
990 KENMORE AVENUE  
BUFFALO, N.Y. 14216  
716 873-0442  
ROCKE INTERNATIONAL CORP.  
EXPORT  
13 E. 40TH STREET  
NEW YORK, N.Y. 10016  
212 MU 9-0200  
MAITLAND K SMITH CO.  
1605 CHATHAM AVE.  
CHARLOTTE, N. C. 28205  
704 376-5951  
C L PUGH CO.  
2144 RIVERSIDE DRIVE  
COLUMBUS 21, OHIO  
614 486-9678  
TWX 614 759-0084  
DALE G WEBER COMPANY  
WEATHERLY BLDG., SUITE 306  
PORTLAND, OREGON 97214  
503 234-0686  
BROTHERS & CONNEEN ASSOCS.  
131 HARNED ROAD  
SPRINGFIELD, DEL. CO., PA.  
215 KI 3-8641  
C L PUGH CO.  
5125 CRESTLINE DR.  
PITTSBURGH34, PA.  
412 531-2731  
J Y SCHOONMAKER CO.  
5328 REDFIELD AVENUE  
DALLAS, TEXAS 75235  
214 631-8480  
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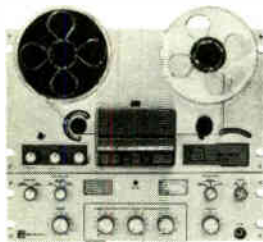
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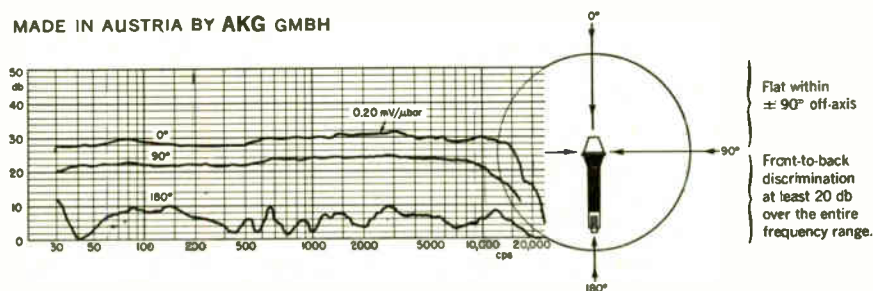
For Boom Operation—No frequency discriminating characteristics in off-axis pickup.

In the D-202ES, two independent microphone capsules are incorporated in a single microphone housing, connected by means of a cross-over network, free of phase distortion. Each of the capsules is optimally adjusted to a specific frequency pickup range; one for low frequencies, and the other for high frequencies. The cross-over is at 500 cps.

This unique arrangement achieves a wide, smooth frequency range (30-15,000 cps  $\pm$  2 db) and a cardioid pattern with a front-to-back discrimination of never less than 20 db over the entire frequency range. In addition, the microphone offers a 90° off-axis response which is completely parallel to the 0° (on-axis) curve.

These features offer several advantages in practical applications: The flat frequency response enables control of feedback at any frequency. The uniform front-to-back discrimination of at least 20 db virtually eliminates feedback and offers almost complete freedom in microphone and speaker placement.

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The parallel 90° off-axis response is of particular importance in sound reinforcement and recording applications, to achieve a natural reproduction of all frequencies introduced to the microphone  $\pm$  90° off-axis.

The D-202ES utilizes a sintered bronze screen which is extremely rugged and protects the microphone systems from iron particles and dust. It also acts as a windscreen and is waterproof.

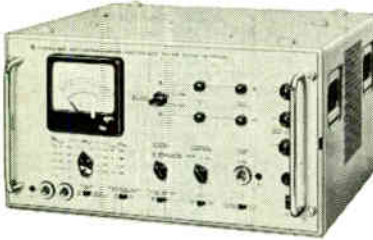
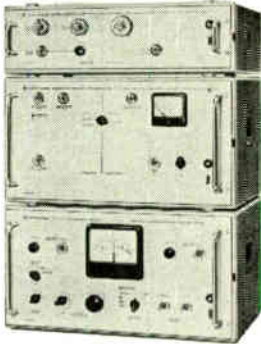

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# Measure Vital Characteristics of Broadcasting Systems\*

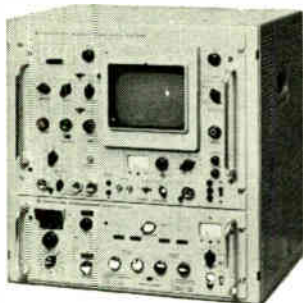
| VIDEO NOISE  | GROUP DELAY  | FIELD STRENGTH  |
|--|--|---|
| <p><b>UPSIF VIDEO NOISE METER</b></p>  <p>Designed for noise voltage measurements on TV cameras, film scanners, video tape recorders, radio links, coaxial lines, TV transmitters, receivers and transposer, with synch. Signals.</p> <ul style="list-style-type: none"> <li>• 40 Hz to 5 MHz</li> <li>• 7 Measurement Ranges: 1/3/10/30/100/300/1000 mVpp</li> <li>• True RMS or Peak-to-Peak Indications</li> </ul> | <p><b>LFM TEST ASSEMBLY</b></p>  <p>Determine group (envelope) delay of video and TV transmission systems.</p> <ul style="list-style-type: none"> <li>• 0.1 - 10 MHz and 25-250 MHz (ext. to 1 GHz)</li> <li>• <math>\pm 10</math> to <math>\pm 1000</math> nsec.</li> <li>• Using Type SWOF sweep system group delay is instantaneously displayed on CRT.</li> </ul> | <p><b>HUZ FIELD STRENGTH METER</b></p> <p>Covers FM, TV, aircraft, police and mobile radio bands for determining propagation conditions, polarization and radiation patterns. Used as a selective voltmeter, it measures antenna gain and cable attenuation.</p> <ul style="list-style-type: none"> <li>• 47 to 225 MHz</li> <li>• 1 <math>\mu</math>V to 100 mV</li> <li>• FM &amp; AM Detection</li> <li>• Portable, Weights only 9 lbs.</li> <li>• Includes Built-In Rechargeable Batteries</li> </ul>  |

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FORRISTAL-YOUNG SALES CO  
7110 OAKLAND AVENUE  
ST. LOUIS, MISSOURI  
MI 5 2360  
SIMBRKOFF SALES COMPANY  
71 VALLEY STREET  
SOUTH ORANGE, NEW JERSEY  
763 7900  
F EDWIN SCHMITT CO INC  
311 MEACHAM AVENUE  
ELMONT, L I, N Y  
437 8150  
MCFADDEN SALES COMPANY  
150 EAST BROAD STREET  
COLUMBUS, OHIO  
221 3363  
SAMUEL K MACDONALD INC  
1531 SPRUCE STREET  
PHILADELPHIA, PENN  
KI 5 1205  
CAMPION SALES COMPANY  
9002 CHANCELLOR ROW  
DALLAS, TEXAS  
ME 1 3390  
STEVENSON COMPANY  
2045 WALKER LANE  
SALT LAKE CITY, UTAH  
277 2515  
REPS IN OTHER COUNTRIES  
C M ROBINSON AGENCIES  
1550 ERIN STREET  
WINNIPEG, MANITOBA  
774 1855  
A C SIMMONDS & SONS LTD  
100 MERTON STREET  
TORONTO, ONTARIO  
485 9111

#### SIGMA INDUSTRIES INCORPORATED

SALES MANAGER  
K. C. MONROE  
COMPANY ADDRESS  
1115 OBRRIEN DRIVE  
MENLO PARK, CALIF. 94025  
COMPANY REPRESENTATIVES  
R A YOUNG & CO  
P O BOX 3884  
GLENDALE, CALIF  
213 245 3721  
MOUNTAIN STATES MACHINERY CO  
1526 BLAKE ST  
DENVER, COLO  
303 244 7421  
WM F HEMMINGER CO INC  
BOX 6008  
SARASOTA, FLA  
813 388 1800  
HAWAIIAN LTNG & SUPPLY CORP  
726 KOHOU ST  
HONOLULU, HAWAII  
964 889  
COURIER SALES INC  
2060 F 54TH MO 10  
INDIANAPOLIS, IND  
317 251 2401  
GITRE CO INC  
12909 W EIGHT MILE RD  
DETROIT, MICH  
313 341 9270  
R W FARRIS CO INC  
1715 BALTIMORE AVE  
KANSAS CITY, MISSOURI  
816 HA 1 1751  
DIPRO INC  
P O BOX 1427  
MARYLAND HEIGHTS, MO  
314 432 3444  
R A COLUCCI CO  
P O BOX 447  
MINEOLA, L I, N Y  
516 PT 6 D397  
RUMSEY ELECTRIC CO  
3RD & HUNTING PARK AVE  
PHILA, PA  
215 GL 5 9900  
R L WRIGHT & ASSOC

P O BOX 17447  
DALLAS, TEXAS  
714 285 8701  
M K WIDDEKIND CO INC  
815 W EWING ST  
SEATTLE, WASH  
206 AT 4 8020

#### SIGMA INSTRUMENTS INCORPORATED

SALES MANAGER  
FRANK BURRIDGF  
COMPANY ADDRESS  
170 PEARL STREET  
BRAINTREE, MASS. 02185  
COMPANY REPRESENTATIVES  
TECHNICAL MARKETING INC  
904 BOB WALLACE AVE ROOM 117  
HUNTSVILLE ALABAMA  
202 534 2487  
WILLIAMS ASSOCIATES  
1110 EAST MCDOWELL ROAD  
PHOENIX, ARIZONA  
602 254 6085  
PENWARDEN ASSOCIATES  
14547 TITUS ST  
VAN NUYS, CALIF  
713 782 4970  
MCCARTHY-KFLLY & ASSOC INC  
279 NORTH BAY SHORE BLVD  
SAN MATEO, CALIF  
415 DI 2 8351  
WILLIAMS ASSOCIATES  
4971 JACKSON STREET  
DENVER, COLORADO  
303 388 4391  
TECHNICAL MARKETING INC  
P O BOX 237  
LARGO, FLORIDA  
813 596 0503  
TECHNICAL MARKETING INC  
1511 E ROBINSON ST  
ORLANDO, FLORIDA  
305 424 8531  
SIGMA INSTRUMENTS INC  
3158 DES PLAINES AVENUE  
DES PLAINES, ILLINOIS  
312 296 5595  
LESLIE M DEVOE COMPANY  
4010 WASHINGTON BLVD  
INDIANAPOLIS, INDIANA  
317 283 1395  
JR SALES ENGR INC  
3550 COTTAGE GROVE AVE S E  
CEDAR RAPIDS, IOWA  
319 365 5259  
BARCOCK-BOHAKER-STIDDARD  
880 BONIFANT STREET  
SILVER SPRING, MARYLAND  
301 588 4047  
W R HUMMON & ASSOCIATES  
P O BOX 501  
FARMINGTON, MICHIGAN  
313 474 0661  
RHODE ELECTRONIC SALES  
2510 EAST 7TH AVENUE  
ST. PAUL, MINNESOTA  
612 777 8197  
JOHN DURBIN COMPANY  
12809 MANCHESTER ROAD  
ST. LOUIS, MISSOURI  
314 966 3003  
SIGMA INSTRUMENTS INC  
50 NORTH FRANKLIN TURNPIKE  
MARRON PLOG  
HO-HO-KUS, NEW JERSEY  
201 652 2900-6  
WILLIAMS ASSOCIATES INC  
3221 SILVER AVENUE S E  
ALBUQUERQUE, NEW MEXICO  
505 255 9632  
H C JOHNSON AGENCIES INC  
P O BOX 215  
FAYETTEVILLE, NEW YORK  
315 637 9383  
H C JOHNSON AGENCIES INC  
111 MOUNT HOPE AVENUE  
ROCHESTER, NEW YORK  
716 232 2688  
H C JOHNSON AGENCIES INC  
P O BOX 86  
BRANDYWINE STATION  
SCHENECTADY, NEW YORK  
518 374 5901  
H C JOHNSON AGENCIES INC  
8 LOS ROBLES STREET  
WILLIAMSVILLE, NEW YORK  
716 632 7880-1  
D G W INC  
1402 EAST MOREHEAD STREET  
CHARLOTTE, N CAROLINA  
704 334 7090  
D G W INC  
3389 NOTTINGHAM ROAD  
WINSTON-SALEM, N CAROLINA  
919 723 4205  
JACK C HOFFSTETTER COMPANY  
3605 NO DIXIE DRIVE  
DAYTON, OHIO  
513 278 6721  
JACK C HOFFSTETTER COMPANY  
742 KENRIDGE ORIVE  
CLEVELAND, OHIO  
216 449 0944  
SEATRONICS INC  
6415 CANYON COURT  
PORTLAND, OREGON  
503 292 8887  
BARCOCK-BOHAKER-STIDDARD  
130 W LANCASTER AVE  
WAYNE, PENNSYLVANIA  
215 688 8288  
P J SCANLON CO INC  
724 C SOUTH SHERMAN STREET  
RICHARDSON, TEXAS  
214 231 4661  
WILLIAMS ASSOCIATES INC

2461 SOUTH MAIN STREET  
SALT LAKE CITY, UTAH  
801 466 8709  
SFATRONICS INC  
5931 4TH AVENUE SOUTH  
SEATTLE, WASHINGTON  
REPS IN OTHER COUNTRIES  
FLECTRO-TEC MARKETERS LTD  
1624 WEST THIRD AVENUE  
VANCOUVER, BRITISH COLUMBIA  
604 731 6377-8-9  
ELECTRO-TEC MARKETERS LTD  
211-1767 MAIN ST NO  
WINNIPEG, MANITOBA  
338 2884  
D T SHAW COMPANY  
5150 DUNDAS STREET WEST  
ISLINGTON, ONTARIO  
416 231 2706  
D T SHAW COMPANY  
1966 GRAHAM BLVD  
MONTREAL, QUEBEC  
514 735 1541

#### THE SINGER COMPANY

SALES MANAGER  
MORTON G. SCHERAGA  
RRAND NAMES  
MARKETING MANAGER  
SENSITIVE RESEARCH  
PANORAMIC  
EMPIRE  
GERTSCH  
COMPANY ADDRESS  
915 PEMBROKE STREET  
BRIDGEPORT, CONN, 06608  
COMPANY REPRESENTATIVES  
CARL A STONE ASSOCIATES  
3855 CARDIFF AVE  
CULVER CITY, CALIF  
213 870 7771  
WILLIAMS ASSOCIATES  
4971 JACKSON ST  
DENVER, COLORADO  
303 388 4391  
BARD ASSOCIATES  
SHAWMUT @ BEACH STS  
LA GRANGE, ILL  
312 354 0660  
INSTRUMENT ASSOCIATES  
30 PARK AVE  
ARLINGTON, MASS  
617 648 2922  
BURLINGAME ASSOCIATES  
510 S FULTON AVE  
MOUNT VERNON, N. Y.  
914 664 7530  
JAMES L HIGHSMITH & CO  
3733 MONROE ROAD  
CHARLOTTE, N. C.  
704 333 7743  
ARNOLD BARNES CO  
740 S SHERMAN ST  
RICHARDSON, TEX  
214 235 4541  
RUSH DRAKE ASSOCIATES  
6133 MAYNARD AVE S  
SEATTLE, WASH  
206 725 2700  
REPS IN OTHER COUNTRIES  
WHITTAKER ELECTRONICS LTD  
42 HOWDEN AVE  
OTTAWA, ONT  
612 224 1221

#### SINGER PRODUCTS COMPANY

INCORPORATED  
SALES MANAGER  
ALVIN J. SCHWARTZ  
BRAND NAMES  
SINTRONIC  
COMPANY ADDRESS  
95 BROAD STREET  
NEW YORK, NEW YORK 10004

#### SITCO ANTENNA COMPANY

SALES MANAGER  
GUSTAVE BERLINER  
BRAND NAMES  
SITCO  
COMPANY ADDRESS  
10330 NE MARX  
PORTLAND, OREGON 97220

#### SOLA ELECTRIC

##### DIV SOLA BASIC INDUSTRIES

MARKETING MANAGER  
S. E. SPELTZ  
BRAND NAMES  
SOLA R  
SOLATRON R  
HERC-MITE R  
COMPANY ADDRESS  
1717 BUSSE ROAD  
ELK GROVE VILLAGE, ILL. 6000  
439 2800  
COMPANY REPRESENTATIVES  
DICK BELLEW SALES CO  
EL DORADO, ARKANSAS  
863 8325  
SOLA ELECTRIC  
LOS ANGELES, CALIF  
254 9223  
ELECTRONIC COMPONENT SALES  
LITTLETON, COLO  
798 8481  
MILLAR-HUTTO ASSOC  
WINTER PARK, FLORIDA  
647 7407  
MILLAR-HUTTO ASSOC  
ATLANTA, GA  
876 0919  
HALGIN SALES  
CEDAR RAPIOS, IOWA  
363 5119

HALGIN SALES  
MISSION, KANSAS  
722 2441  
DICK BELLEW SALES CO  
NEW ORLEANS, LA  
282 9629  
TESSCO  
TIMONIUM, MD  
252 5610  
NAT KRONSTADT ASSOC  
SILVER SPRING, MD  
585 6141  
SOLA ELECTRIC  
NEEDHAM HEIGHTS, MASS  
444 8280  
R C MERCHANT & CO  
DETROIT, MICH  
535 6000  
R C MERCHANT & CO  
BENTON HARBOR, MICH  
925 4211  
MEL FOSTER CO INC  
MINNEAPOLIS, MINN  
374 2612  
HALGIN SALES  
CLAYTON, MISSOURI  
721 4415  
SOLA ELECTRIC  
ENGLEWOOD CLIFFS, N. J.  
567 3880  
SOLA ELECTRIC  
CAMDFN, N. J.  
365 7744  
ELECTRONIC COMPONENT SALES  
ALBUQUERQUE, N M  
344 8130  
HARRIES & KERSHAW  
EAST AURORA, N Y  
652 1221  
HARRIES & KERSHAW  
WEBSTER, N Y  
671 6365  
HARRIES & KERSHAW  
FAYETTEVILLE, N Y  
446 3112  
MILLAR-HUTTO ASSOC  
CHARLOTTE, N. C.  
366 2061  
SOLA ELECTRIC  
CLEVELAND, OHIO  
521 8038  
SOLA ELECTRIC  
CINCINNATI, OHIO  
271 6870  
ROBERT E NESBITT CO  
DALLAS, TEXAS  
357 4601  
ROBERT E NESBITT CO  
HOUSTON, TEXAS  
528 3811  
ELECTRONIC COMPONENT SALES  
SALT LAKE CITY, UTAH  
262 3700  
NORTHWESTERN AGENCIES, INC  
SEATTLE, WASHINGTON  
623 8882  
WALTER M BRAUN  
MILWAUKEE, WIS  
332 1040

#### SOLITRON DEVICES INCORPORATED

SALES MANAGER  
ROBERT RUBIN  
COMPANY ADDRESS  
256 OAK TREE ROAD  
TAPPAN, NEW YORK 10983  
COMPANY REPRESENTATIVES  
R HALES PRIMDOR & ASSOC.  
1225 EAST NORTHVIEW AVENUE  
PHOENIX, ARIZONA  
602 944 9631  
WEB ELECTRONIC ASSOCIATES  
P O BOX 45734  
5716 W MANCHESTER  
LOS ANGELES, CALIF.  
213 617 8297  
WESTERN REGIONAL SALES OFFICE  
6311 YUCCA STREET  
HOLLYWOOD, CALIF. 90028  
213 464 0006  
WESTERN OIST. SALES OFFICE  
C/O WINCO INC  
P O BOX 881  
MT VIEW, CALIF 94042  
415 961 8510 OR 961 3599  
ELECTRONIC SALES  
995 S CLEMONT #302  
DENVER, COLORADO 80222  
303 756 4148  
CENTRAL REGIONAL SALES OFFICE  
C/O G MCL COLE COMPANY  
6710 W HIGGINS ROAD  
CHICAGO, ILLINOIS 60656  
312 774 3535  
TECHNICAL REPRESENTATIVES CO  
4000 MEADOWS DRIVE  
INDIANAPOLIS, INOIANA 46205  
317 546 4967  
TECHNICAL REPRESENTATIVES CO  
707 ANTHONY WAYNE BANK BLDG  
FT. WAYNE, INDIANA 46802  
219 742 1891  
ELECTRONIC SALES  
1310 HERTZ DRIVE S E  
CEDAR RAPIDS, IOWA  
319 364 4342  
JERRY BRESSON ASSOCIATES  
511 N CHARLES STREET  
BALTIMORE, MD.  
301 MU 5 0100  
CIRCUIT SALES COMPANY  
LAKEVIEW OFFICE PARK OOR 1  
591 NORTH AVENUE  
WAKEFIELD, MASS.  
617 245 5320  
NEW ENGLANO REGIONAL SALES OF

52 PICKERING STREET  
NEEDHAM, MASS.  
617 444 1152  
THE HARTWICK-VAN AUKER CO  
BOX 122 N E STATION  
19831 PURLING BROOK ROAD  
LIVONIA, MICH. 48152  
313 476 5757  
RHODE ELECTRONIC SALES  
2510 EAST 7TH AVENUE  
ST. PAUL, MINN. 55109  
617 777 8197  
JOHN DURBIN COMPANY  
12809 MANCHESTER RD  
ST. LOUIS, MO. 63131  
314 966 3003  
EASTERN REGIONAL SALES OFFICE  
37 ELM STREET  
WESTFIELD, N.J.  
201 232 4243  
G V L ASSOCIATES  
338 GREEN STREET  
SYRACUSE, NEW YORK  
315 478 7712  
S-J SALES ASSOCIATES  
148-05 ARCHER AVENUE  
JAMAICA, N.Y. 11435  
212 Ax 1 3232  
JAKE RUDISILL ASSOCIATES  
2009 MO TRVON STREET  
CHARLOTTE, N.C. 28206  
704 377 6901  
THE WHELAN CORPORATION  
2975 FAR HILLS AVENUE  
OAYTON, OHIO 45419  
513 298 9997  
THE WHELAN CORPORATION  
8323 CEDAR ROAD  
CHESTERLAND, OHIO 44026  
216 442 8340  
JERRY BRASSON ASSOCIATES  
107 FORREST AVENUE  
NARBERTH, PA. 19072  
215 TE 9 6770  
W PAT FRALIA COMPANY  
6100 CAMP BOWIE BLVD  
P O BOX 12625  
FORT WORTH, TEXAS 76116  
317 738 2394  
EASTERN REGIONAL SALES OFFICE  
1121 ARLINGTON BLVD  
T-321  
ARLINGTON, VIRGINIA  
301 725 1349  
LARRABEE & ASSOCIATES  
2117 SECOND AVENUE  
SEATTLE, WASHINGTON  
206 882 2358  
REPS IN OTHER COUNTRIES  
CANTRONICS LTD  
17 DELLBANK ROAD  
DOWNSVIEW, ONTARIO  
CANTRONICS LTD  
4252 BRAILLE AVENUE  
MONTREAL, QUEBEC  
416 636 8311

SONY CORPORATION OF AMERICA

SALES MANAGER  
H. L. JOHNSON  
COMPANY ADDRESS  
516 WEST FLORENCE AVE.  
INGLEWOOD, CALIF. 90301  
COMPANY REPRESENTATIVES  
V T RUPP CO  
1182 LOS ALTOS AVE  
LOS ALTOS, CALIF  
REEVES ELECTRONICS INC  
7512 SANTA MONICA BLVD  
LOS ANGELES, CALIF 90046  
213 876 3300  
GENERAL ELECTRONICS INC  
4158 PIEDMONT AVENUE  
OAKLAND, CALIFORNIA  
415 655 2711  
GORDON ENTERPRISES INC  
5362 NORTH CAHUENGA BLVD  
NORTH HOLLYWOOD, CALIFORNIA  
213 766 3725  
LANDERS ELECTRONIC  
735 ROUTE 5  
SOUTH WINOSOR, CONN D6074  
JAMES R EBERLY CO  
1207 POTOMAC ST N W  
WASHINGTON, O C 20007  
202 338 2277  
COMMUNITY UTILITY INC  
96D ORANGE AVE  
WINTER PARK, FLA  
VIDEOTRONICS INC  
P O BOX 4313  
ATLANTA, GEORGIA 30302  
404 525 8687  
INDUSTRIAL TELEVISION SER  
5224 W OIVERSEY  
CHICAGO, ILLINOIS  
402 466 2331  
WEBSTER ENGINEERING  
823 SO GREENWOOD AVE  
PARK RIDGE, ILLINOIS  
VIDEO LEASING  
154 EAST ERIE ST  
CHICAGO, ILL  
312 377 3286  
ELECTRONIC TECHNICAL SERVICES  
3844 NO COLLEGE AVE  
INDIANAPOLIS, INDIANA  
IMPERIAL EQUIPMENT COMPANY  
2381 N 24TH ST  
LAFAYETTE, INDIANA  
OAVIS ELECTRONICS  
W THIRO & JEFFERSON  
WATERLOO, IOWA 50701  
319 234 6626  
RADIO SUPPLY COMPANY INC  
115 LAURA

WICHITA, KANSAS 67211  
316 AM 7 5216  
AMERICAN SOUND SERVICE INC  
675 WEST THIRD ST  
COVINGTON, KENTUCKY 40208  
502 261 9024  
ELECTRONIC DEVICES INC  
411 CENTRAL AVENUE  
LOUISVILLE, KENTUCKY 40208  
502 637 7720  
LOUISIANA ELECTRONICS  
3121 CONVENTION ST  
BATON ROUGE, LOUISIANA  
504 348 4962  
INTERNATIONAL SOUND CORP  
3589 PARK HEIGHTS AVENUE  
BALTIMORE, MARYLAND 21215  
301 FO 7 6409  
DEMAMBRO SOUND EQUIPMENT  
1095 COMMONWEALTH AVE  
BOSTON, MASSACHUSETTS  
617 254 7870  
AMERICAN MICROWAVE  
COMMUNICATIONS INC  
204 NATL BANK BLDG BOX 216  
ALPENA, MICHIGAN  
517 356 1510  
THALNER ELECTRONIC LABS  
7150 JACKSON ROAD  
ANN ARBOR, MICHIGAN  
NORTHWEST ELECTRONICS  
336 HOOVER ST N E  
MINNEAPOLIS, MINNESOTA  
ARMET CORPORATION  
625 E MCDOWELL ROAD  
JACKSON, MISSISSIPPI  
601 353 3479  
CRAMER ENGINEERING  
8325 WORNALL ROAD  
KANSAS CITY, MISSOURI 64114  
816 DE 3 7914  
NOTIFIER ENGINEERING INC  
3700 N 56TH ST  
LINCOLN, NEBRASKA  
402 466 2331  
REE TELEVISION  
1200 W CHESTNUT ST  
UNION, NEW JERSEY  
201 678 8810  
VIDEO MON SALES & SERVICE  
1401 VALENCIA SOUTHEAST  
ALBUQUERQUE, NEW MEXICO  
VIDEO PROJECTS  
143-78 94TH AVE  
JAMAICA, N Y  
ALCOR INC  
215 SOUTH TIOGA STREET  
ITHACA, NEW YORK 14850  
607 4242  
PIONEER STANDARD  
ELECTRONICS INC  
5403 PROSPECT AVENUE  
CLEVELAND, OHIO  
216 432 0010  
MAGNETIC SERVIC CORP  
1628 WEST FIRST AVENUE  
COLUMBUS, OHIO  
THE SONAX COMPANY  
P O BOX 11415  
OKLAHOMA CITY, OKLAHOMA 73314  
405 CE 5 3611  
COLUMBIA ELECTRONICS COMPANY  
8755 S W CANYON ROAD  
PORTLAND, OREGON 97225  
503 292 2625  
ALLIED SOUND INC  
206 12TH AVE S  
NASHVILLE, TENN 37203  
SOUTHWEST SOUND EQUIPMENT CO  
1518 N ST. MARYS  
SAN ANTONIO, TEXAS  
CA 6 9271  
STROMBERG-CARLSON CORP  
2341 FARRINGTON  
DALLAS, TEXAS 75207  
214 ME 1 5470  
VIDEO WEST INCORPORATED  
P O BOX 1087  
PROVO, UTAH  
801 373 5239  
AERO MARC CO  
2304 RAINIER AVE S  
SEATTLE, WASHINGTON

SORENSEN OPERATION

RAYTHEON CO.  
MARKETING MANAGER  
ROBERT SLATER  
COMPANY ADDRESS  
RICHARDS AVENUE  
NORWALK, CONN. D6856

SOUNDRAFT INDUSTRIES

SALES MANAGER  
JOHN G. GILLIAM  
COMPANY ADDRESS  
P. O. BOX 1745  
ANN ARBOR, MICH. 48106  
313 663 6656

THE SOUND SCRIBER CORPORATION

VICE PRESIDENT - SALES  
FREDRICK A. BIERTUEMPFEL  
BRAND NAMES  
SOUND SCRIBER  
COMPANY ADDRESS  
6 MIDDELTOWN AVE.  
NORTH HAVEN, CONN. 06473  
COMPANY REPRESENTATIVES  
ROBERT YELLIN  
1819 W 6TH ST  
LOS ANGELES, CALIF  
NOEL CIMINI  
7026 W NORTH AVE  
CHICAGO, ILLINOIS  
JAMES MURPHY  
8121 GEORGIA AVE

SILVER SPRING, MD  
PHILLIP W HEYSE  
2611 HAMILTON AVE  
TRENTON, N JERSEY  
RICHARD BIRO  
913 STEMMONS TOWERS SO  
DALLAS, TEXAS  
REPS IN OTHER COUNTRIES  
BLAIR-BEHNSEN LTD  
835 CAMBIE ST  
VANCOUVER, B C  
JOHN PIERCE HOLOINGS LTD  
103 BLAKE ST  
TORONTO, ONTARIO  
N MARTINEAU & SON  
1019 BLEURY ST  
MONTREAL, QUEBEC

SOUTH SHORE RADIO-TELEPHONE INC

PRFIDENT  
JESS PETERS  
COMPANY ADDRESS  
6405 OLCOTT AVE.  
HAMMOND, IND. 46320  
219-TILDEN 4-9320

SOUTHWESTERN COMMUNICATION

CENTRAL  
SALES MANAGER  
JESSE L. RIPPUS  
COMPANY ADDRESS  
1512 INDIAN WELLS RD, BOX 64  
ALAMOGOROO, NEW MEXICO 88310

SPARTA ELECTRONIC CORPORATION

VICE PRESIDENT, SALES  
JACK J. LAWSON  
BRAND NAMES  
SPARTA-MATIC  
SPARTA  
COMPANY ADDRESS  
5851 FLORIN-PERKINS RD.  
SACRAMENTO, CALIF. 95828  
916-383-5553  
COMPANY REPRESENTATIVES  
JESS SWICEGOOD  
PO BOX 1828  
DOTHAN, ALABAMA 36302  
SY 2-2161  
EUGENE O BRADLEY  
1328 W FLOWER  
PHOENIX, ARIZONA 85D13  
AM 6-7292  
RICHARD R. BROOKS  
3706 W 225TH STREET  
TORRANCE, CALIF 90505  
373-2309  
HIGHLAND ASSOC  
C/O HENRY BROUGHALL  
600 MARBLE STREET  
BROOMFIELD, COLO 8002D  
466-3851  
GLENN E WEBSTER  
WEBSTER ENGR CO  
823 SO GREENWOOD AVE  
PARK RIDGE, ILLINOIS 60D06  
823-8206  
HARRISON RADIO INC.  
C/O HERBERT ARMS  
BOX 327  
CORDON, INDIANA 47112  
RE 8-5752  
JIM PIPER ASSOCIATES  
C/O JIM FLANAGAN  
TEN HAVEN STREET  
DOVER, MASS D2D3D  
934-2498  
DAVID VELDMSA  
AUOIO DISTR. INC.  
2342 DIVISION AVENUE SOUTH  
GRAND RAPIDS, MICH 495D7  
GL 2-5495  
CAROLINA RADIO SUPPLY  
C/O ROBERT WINDSOR  
838 HUFFMAN STREET  
GREENSBORO, N.C. 274D5  
BR 3-6358  
A C MC MILLAN  
16679 S W MAPLE CIRCLE  
LAKE OSWEGO, OREGON 97403  
636-6257  
CAROLINA RADIO SUPPLY  
C/O RUSS SUTTON  
221 W WASHINGTON STREET  
GREENVILLE, S.C. 296D2

SPEEQY-O ENTERPRISES

COMPANY ADDRESS  
6252 SANTA MONICA BLVD.  
HOLLYWOOD, CALIF. 9DD38  
REPS. IN OTHER COUNTRIES  
G. N. MACKENZIE LTO.  
433 JARVIS  
TORONTO, ONTARIO

SPENCER-KENNEY LABORATORIES

SALES MANAGER  
DON LEWIRE  
BRAND NAMES  
COLORBURST  
COLOR TAP  
COMPANY ADDRESS NO. 1  
1360 SOLDIERS FIELO ROAO  
BOSTON 35, MASS  
COMPANY ADDRESS NO. 2  
5800 N 19TH AVE.  
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BOX 4426  
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INOEPENDENCE, KAN.  
316-331-3078  
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BOX 5387  
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HYDE ELECTRONICS  
2727 N CENTRAL AVE  
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SUITE 512  
1 UNION BANK SQUARE  
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TWX 910 651 3250  
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WILMETTE, ILLINDIS  
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TWX 301 828 7046  
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612 488-7293  
TWX 612 551 0053  
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1110 S BRENTWOOD BLVD  
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314 725-9794  
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TWX 910 760 1663  
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ST. LOUIS, MO 63119  
314 968-0300  
TWX 910 760 1663  
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201 773 5010  
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TWX 412 642 3196  
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TWX 215 569 8575  
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TWX 214 231 1400  
VISTA ENGINEERING ASSOC  
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713 622 5680  
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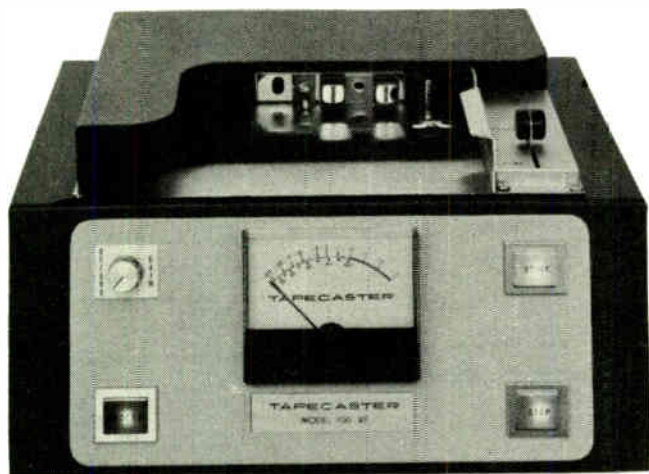
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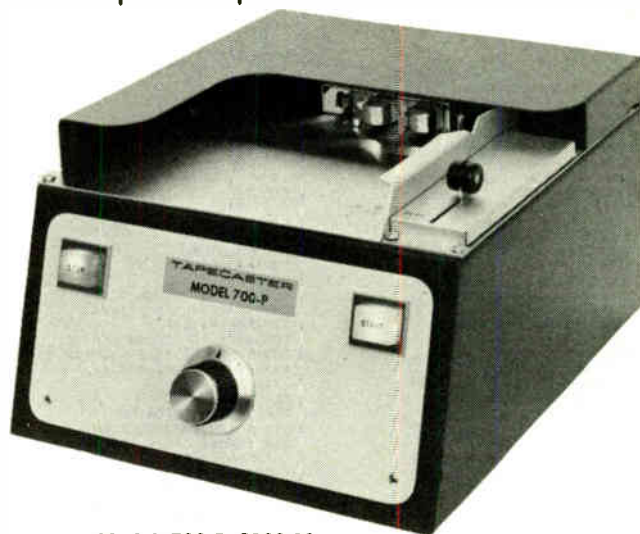
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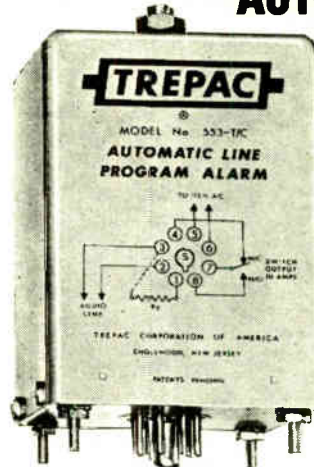
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We Guarantee  
it for 5 Years

TREPAC MODEL 553 T/C AUTOMATIC PROGRAM ALARM senses variations of signal level, and provides automatic control of alarm or other associated equipment. It eliminates the need for continuous personal attention. The unit is activated whenever line program audio level deteriorates below a preset threshold.

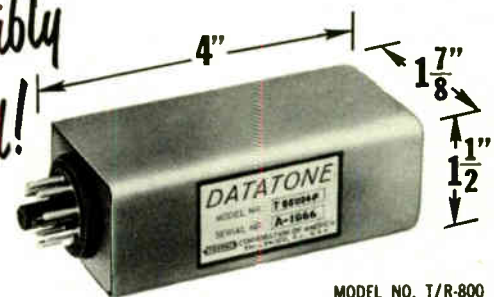
The output power "switches" either off or on as desired when audio level drops for a specific length of time. In the absence of a signal, the unit will "switch" off after a fixed duration. Whenever audio programming returns to its nominal level, the output control "switches" on. All "switching" is done automatically.

Accurate time control predetermines wide range of timing intervals available. The time duration (or delay) is adjustable from 0.1 seconds to as long as 30 minutes, depending on the application.

## DATATONE® TRANSMITTERS RECEIVERS

MINIATURIZED TRANSISTORIZED SOLID/STATE NO TUNED REEDS NO TUNING FORKS

*Sensibly priced!*



MODEL NO. T/R-800

### SPECIFICATIONS

**DATATONE TRANSMITTER:** Designed to bridge a 600 ohm transmission line with less than 1 db loading and through contact closure deliver an undistorted tone signal level of 1 Milliwatt. Calibrated internal attenuator permits setting output level to required signaling condition by simple terminal strapping.

**DATATONE RECEIVER:** Designed to bridge a 600 ohm transmission line with less than 0.5 db loading, and close contacts or power an external relay load upon receiving a tone pulse from its companion transmitter. A full dynamic range of greater than 35 db and a sensitivity of -35 dbm with sharp skirt filters, assures reliable operation with adjacent channel separation of as little as 100 cycles.

Both units are rated for continuous operation over a temperature range of 0°C to 50°C from a 12/24/48 VDC supply.

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TRW SEMICONDUCTORS INC  
650 N SEPULVEDA  
EL SEGUNDO, CALIF. 90245  
213 322-6685  
GENE STRAUBE ASSOCIATES  
483 WILLOW ROAD  
MENLO PARK, CALIF.  
415 841-4450  
STRAUBE ASSOCIATES  
P O BOX 1649  
BOULDER, COLORADO  
303 443-8600  
CARTWRIGHT & BEAN  
20100 N E 25TH COURT  
NO MIAMI BEACH, FLA. 33160  
305 677-3480  
FLORIDA ELECTRONIC ENGR.  
609 E COLONIAL DRIVE  
ORLANDO, FLORIDA 32803  
305 425-0032  
CARTWRIGHT & BEAN  
395 TRITON ROAD  
ORMOND BEACH, FLORIDA  
305 677-3480  
CARTWRIGHT & BEAN  
3223 CAINS HILL PLACE  
ATLANTA, GEORGIA 30305  
404 237-2273  
JOHN G TWIST COMPANY  
5222 DIVERSEY AVENUE  
CHICAGO, ILL. 60639  
312 SP 7-2250  
TWX 312 265-1165  
R O WHITESELL ASSOC.  
CENTRAL BLDG RM 272  
FORT WAYNE, IND. 46802  
219 743-4411  
TWX 219 241-0894  
R O WHITESELL ASSOC  
HEADQUARTERS  
6620 E WASHINGTON ST  
INDIANAPOLIS, IND. 46219  
317 359-5374  
TWX 317 635-9766  
HERBERT B KIRKLAND ASSOC  
210 FIFTH ST SE  
CEDAR RAPIDS, IOWA 52401  
319 363-6425  
R O WHITESELL ASSOC  
3620 LEXINGTON RD  
LEX MANOR BLDG RM 223  
LOUISVILLE, KY.  
502 893-7303  
CARTWRIGHT & BEAN  
1812 BULLARD AVENUE  
METAIRIE, LOUISIANA 700D3  
504 834-8312  
TRW SEMICONDUCTORS INC  
P O BOX 8654  
BALTIMORE, MD. 2121D  
301 323-4300  
TRW SEMICONDUCTORS INC  
P O BOX 603  
NORWOOD, MASS.  
617 275-6076  
R D WHITESELL ASSOC  
303 FIDELITY BLDG  
BENTON HARBOR, MICHIGAN  
616 927-2041  
R O WHITESELL ASSOC  
16801 WYOMING AVE  
DETROIT, MICHIGAN  
313 862-2225  
TWX 313 342-0648  
E A DICKINSON ASSOC  
P O BOX F  
EXCELSIOR, MINN. 55331  
612 474-5273  
TWX 612 961-0471  
L R HARRY ASSOC  
P O BOX 588

GRANDVIEW, MO. 64030  
816 763-3634  
L R HARRY ASSOC  
7603 FORSYTHE  
CLAYTON, MO. 63105  
314 727-6123  
TRW SEMICONDUCTORS INC  
P O BOX 554  
MONTVALE, N.J. 07645  
201 484-5616  
TRW SEMICONDUCTORS INC  
P O BOX 67  
EAST ISLIP, N.Y. 11730  
516 433-3342  
TRW SEMICONDUCTORS INC  
P O BOX 24  
CAMILLUS, NEW YORK  
315 454-4451  
TRW SEMICONDUCTORS INC  
P O BOX 64  
YORKVILLE, N.Y.  
315 454-4451  
MACHINE & PRODUCTS CO  
FRANCE ONLY  
52 WALL STREET  
NEW YORK, N.Y. 10005  
212 WM 4-4370  
CARTWRIGHT & BEAN  
625 HARWYN DRIVE  
CHARLOTTE, N.C. 28205  
704 537-7965  
R O WHITESELL ASSOC  
1172 W GALBRAITH  
CINCINNATI, OHIO 45231  
513 521-2290, 91  
TWX 513 577-1750  
R O WHITESELL ASSOC  
21139 LORAIN AVENUE  
MAGEK BLDG.  
CLEVELAND, OHIO 44126  
216 337-2158  
TWX 216 333-3250  
R O WHITESELL ASSOC  
135 W FIFTH AVENUE  
COLUMBUS, OHIO  
614 488-9731  
TWX 614 759-0680  
R O WHITESELL ASSOC  
4133 S DIXIE AVENUE  
DAYTON, OHIO 45439  
513 298-9546  
TWX 513 944-0526  
ARNESON ASSOC  
P O BOX 12067  
PORTLAND, OREGON 97212  
503 646-3416  
TRW SEMICONDUCTORS INC  
P O BOX 11587  
PHILADELPHIA, PA. 19116  
215 687-1700  
R O WHITESELL ASSOC  
PENN CENTER BLDG  
201 PENN CENTER BLVD  
PITTSBURGH, PA. 15235  
412 242-0100  
CARTWRIGHT & BEAN  
560 SOUTH COPPER STREET  
P O BOX 760  
MEMPHIS, TENN. 38104  
901 276-4442  
VISTA ENGINEERING  
FIRST BANK & TRUST BLDG  
SUITE 430  
RICHARDSON, TEXAS 75080  
214 235-4547  
TWX 214 231-1400  
VISTA ENGINEERING  
7007 RATON DRIVE  
HOUSTON, TEXAS  
713 NA 2-5680  
ARNESON ASSOCS  
74 S LUCILE STREET  
SEATTLE, WASH. 98134  
206 725-7664  
E A DICKINSON ASSOC INC  
3612 GREENBAY AVENUE  
MILWAUKEE, WISCONSIN 53212  
414 264-1090  
REPS. IN OTHER COUNTRIES  
MITSUBISHI TRW COMPANY  
MITSUBISHI DENKI BLDG  
2-12 MARUNOUCHI CHIYODO-KU  
TOKYO, JAPAN  
212-6111  
E V JOHANSEN A/S  
ST KONGENSGADE 93  
COPENHAGEN K, DENMARK  
PALACE 7510  
TECHNIQUE ET PRODUITS  
BOULOGNE, SUR SEINE, FRANCE  
408-16-00  
HEK-OMSB LUBECK  
2400 LUEBECK  
POSTLACH 1810, WEST GERMANY  
52991  
M C P ELECTRONICS  
STATION WHARF WORKS  
ALPERTON, WEMBLEY  
MIDDLESEX, ENGLAND  
WEMRLY 1191  
TELEINSTRUMENT AB  
BOX 14,  
VALLINGBY, SWEDEN  
870345  
BAERLOCHER AG  
ZURICH, SWITZERLAND  
51-429900  
E G LOMAS LTD  
227 LAURIER AVE W  
DOWNS, ONTARIO  
613 CE 2-7106  
JACOBY, MITCHELL  
469-475 KENT STREET  
SYDNEY, N.S.W., AUSTRALIA  
26-2651

**TRYLON, INCORPORATED**

DIRECTOR OF MARKETING  
THOMAS R. HUMPHREY  
BRAND NAMES  
TRYLON  
COMPANY ADDRESS  
ELVERSON, PA. 19520  
COMPANY REPRESENTATIVES  
SAM G HARRIS  
2437 JACKSON PKWY  
VIENNA, VA.  
703 56C-4545

**T Y ELECTRONICS, INC.**

SALES MANAGER  
J. F. SODARO  
COMPANY ADDRESS  
BOX 187  
CULVER CITY, CALIF. 90230

**TURNER MICROPHONE COMPANY**

SALES MANAGER  
DOUG BATTIN  
BRAND NAMES  
TURNER  
COMPANY ADDRESS  
909 17TH STREET  
CEDAR RAPIDS, IOWA 52402  
COMPANY REPRESENTATIVES  
MORRIS F TAYLOR COMPANY  
2328 3RD WAY NE  
BIRMINGHAM, ALA. 35215  
205 853-3673  
WES ALDERSON COMPANY  
8548 WASHINGTON BLVD  
CULVER CITY, CALIF. 90231  
213 VE 7-1398  
LOGAN SALES COMPANY  
463 BREWSTER AVENUE BOX 1219  
REWOOD CITY, CALIF. 94063  
415 369-6726  
GORDON MOSS ELECTRONICS INC  
1530 13TH AVENUE  
P O BOX J  
GREELEY, COLORADO  
303 553-1452  
GORDON MOSS ELECTRONICS INC  
P O BOX 26172  
DENVER, COLORADO 80226  
303 936-4027  
COAKLEY BOYD & ABBETT INC  
6 GAYWOOD DRIVE  
WATERBURY, CONN.  
203 756-8766  
MORRIS F TAYLOR COMPANY  
900 LAKE ELBERT DRIVE  
WINTER HAVEN, FLORIDA 33880  
813 CY 4-2941  
MORRIS F TAYLOR COMPANY  
P O BOX 458 - MAIL  
261 LAKE TRIPLET OR.  
CASSELLBERRY, FLORIDA  
305 838-0821  
MORRIS F TAYLOR COMPANY  
5908 KENNETH AVENUE  
TAMPA, FLORIDA 33604  
813 238 2738  
WM M LINZ & ASSOC  
4001 WEST DEVON  
CHICAGO, ILLINOIS 60646  
312 MU 5-6060  
MORRIS-CUNNINGHAM & ASSOC  
6208 NORTH COLLEGE AVENUE  
INDIANAPOLIS, INDIANA 46220  
317 CL 5-2458  
KELLY-SCHMITZ-WINKLER ASSOC  
3831 43RD STREET  
DES MOINES, IOWA  
515 CR 9-235  
SCOTT ORMSBY SALES  
230 20TH STREET  
NEW ORLEANS, LOUISIANA 70124  
504 488-2414  
MORRIS F TAYLOR COMPANY  
9431 GEORGIA AVENUE BOX 111  
SILVER SPRING, MARYLAND 20907  
301 JU 9-4002  
MORRIS F TAYLOR COMPANY  
3601 ADAMS DRIVE  
SILVER SPRING, MD. 20902  
301 WM 6-3569  
COAKLEY BOYD & ABBETT INC  
P O BOX 248 1424 HIGHLAND  
NEEDHAM, MASS. 02192  
617 444-5470  
R A ALBRECHT COMPANY  
221 LONESOME OAK ROAD  
ROCHESTER, MICHIGAN 48063  
313 651-7081  
STAN CLOTHIER COMPANY INC  
12 WEST 58TH STREET  
MINNEAPOLIS, MINN. 55419  
612 869-3231  
SCOTT ORMSBY SALES CO  
147 CARTER ROAD  
BILOXI, MISS.  
601 432-8467  
KELLY-SCHMITZ-WINKLER ASSOC  
7546 TROOST AVENUE  
KANSAS CITY, MISSOURI 64131  
816 EM 3-5651  
KELLY-SCHMITZ-WINKLER ASSOC  
2319 HAMPTON AVENUE  
ST. LOUIS, MO. 63139  
314 ST 1-6111  
WILLGOLD ELECTRONIC SALES  
18 OLD FARM ROAD  
NORTH CALOWELL, N.J.  
201 CA 6-8363  
WILLGOLD ELECTRONIC SALES  
53 ARTHUR DRIVE  
PARISIPPANY, N.J. 07054  
MORRIS F TAYLOR COMPANY  
P O BOX 23  
MARLTON, N.J. 08053

215 MA 2-0383  
GORDON MOSS ELECTRONICS INC  
2418 BARCELONA DRIVE S W  
ALBUQUERQUE, N.M. 87105  
505 877-9392  
WILLGOLD ELECTRONIC SALES  
170 NORTH VILLAGE AVE  
ROCKVILLE CENTRE, N.Y. 11571  
516 764-4022  
MARSEY SALES INC  
206 PARK AVENUE  
ROCHESTER, N.Y. 14607  
716 442-9700  
MORRIS F TAYLOR COMPANY  
1224 ORESDEN DR., WEST  
CHARLOTTE, N.C. 28205  
704 KE 7-4878  
LES A MORROW COMPANY  
3123 WEST 117TH STREET  
CLEVELAND, OHIO 44111  
216 CL 1-5700  
MORRIS F TAYLOR COMPANY  
201 PENN CENTER BLVD.  
PITTSBURGH, PA. 15235  
412 823-8000  
MORRIS F TAYLOR COMPANY  
APT 105, 9 RICHLAND LANE  
CAMP HILL, PA. 17011  
717 233-3112  
ERNEST L WILKS COMPANY  
1821 NORTH BROADWAY  
CARROLLTON, TEXAS  
214 CH 2-5321  
GORDON MOSS ELECTRONICS INC  
1502 PRESTON STREET  
BOX 8022 Foothills Station  
SALT LAKE CITY 8, UTAH  
801 485-2870  
M K WIODEKINO COMPANY  
815 W EWING STREET  
SEATTLE, WASH. 98119  
AT 4-8020

TV CABLE SUPPLY COMPANY  
SALES MANAGER  
JAMES E. MORTON  
BRAND NAMES  
TVC  
VIDEO INSTRUMENT  
COMPANY ADDRESS  
BOX 38  
CARLISLE, PA. 17013

ULTRA AUDIO PRODUCTS  
FLOON INDUSTRIES, INC  
SALES MANAGER  
DON OLIVER  
BRAND NAMES  
SOUNDDESIGN  
CUSTOMIZER  
CIRCUITESTER  
SPECTACULITE  
COMPANY ADDRESS  
1140 S. ROBERTSON BLVD.  
LOS ANGELES, CALIF. 90035

UNGAR ELECTRIC TOOLS  
ELECTRONIC DIVISION OF  
FLOON INDUSTRIES, INC  
SALES MANAGER  
W. L. NEMRENZ  
BRAND NAMES  
IMPERIAL  
MINI-TIP  
MICRO-TIP  
PRINCESS  
UNGAR  
COMPANY ADDRESS  
2701 W. EL SEGUNDO BLVD.  
HAWTHORNE, CALIF. 90252  
213 757-2151  
COMPANY REPRESENTATIVES  
MORRIS F TAYLOR CO  
2328 3RD WAY, NE  
BIRMINGHAM, ALA. 35215  
205 853-3673  
UNGAR SALES ASSOC  
317 GLASGOW AVE  
INGLEWOOD, CALIF 90301  
213 678-5371  
ELVEY-PROCTOR CO  
1650 LAUREL ST  
SAN CARLOS, CALIF 94071  
415 593-1211  
KOETHER-COX CO  
1325 SOUTH INCA ST  
DENVER, COLO 80223  
303 773-5561  
MORRIS F TAYLOR CO  
5908 KENNETH AVE  
TAMPA, FLORIDA 33604  
813 238-2738  
G MCL COLE CO  
6514 WEST HIGGINS ROAD  
CHICAGO, ILL. 60656  
312 774-3535  
FRANK MCSWEENEY CO  
4123 N KEYSTONE BLVD  
INDIANAPOLIS, INO 46205  
317 547-1112  
STANLEY A HARRIS CO  
60 DEDHAM AVE  
NEEDHAM, MASS 02192  
617 444-4780  
ROBERT MILSK CO  
19375 JAMES COUZENS HWY  
DETROIT, MICH 48235  
313 342-6660  
RAY RIPLEY & ASSOC  
6838 PILLSBURY AVE SO  
MINNEAPOLIS, MINN 55423  
612 866-8682  
L R MASSEY CO  
304 E JEFFERSON ST  
GREENWOOD, MISS 38930

601 443-3038  
DIPRO INC  
P O BOX 1427  
MARYLAND HEIGHTS, MO 63042  
314 432-3444  
R W FARRIS CO INC  
1715 BALTIMORE AVE  
KANSAS CITY, MO 64108  
816 421-1751  
MORRIS F TAYLOR CO  
P O BOX 23  
MARLTON, N. J. 08053  
609 983-1712  
BITTAN ASSOC INC  
381 SUNRISE HWY  
LYNBROOK, LONG ISLAND, N Y  
516 593-3833  
LOUIS W APPELL CO  
11 WARRFN ST  
NEW YORK, N Y 10907  
212 964-4255  
LFONARO D ALLEN CO  
P O BOX 205  
NORTH SYRACUSE, N Y 13212  
315 478-7470  
MORRIS F TAYLOR CO  
1224 DRESDEN DR., W  
CHARLOTTE, N. C. 28205  
704 537-4878  
RAEHR-GREENLEAF & ASSOC  
14700 OETROIT AVE  
CLVELAND, OHIO 44107  
216 221-9030  
MORRIS F TAYLOR CO  
4341 CARLISLE PIKE  
CAMP HILL, PA. 17011  
717 761-2958  
MORRIS F TAYLOR CO  
201 PENN CENTER BLVD.  
PITTSBURGH, PA. 15235  
412 823-8500  
M F KLICPERA CO  
P O BOX 2668  
HOUSTON, TEXAS 77001  
713 748-0874  
JAMES J BACKER CO  
2211 W GALER ST  
SEATTLE, WASH 98119  
206 283-6470

UNITED RADIO SUPPLY INC  
INDUSTRIAL DIVISION  
SALES MANAGER  
JOHN RIES  
BRAND NAMES  
KUSTOM ELECTRONICS  
COMPANY ADDRESS  
829 W. BURNSIDE  
PORTLAND, OREGON 97209  
503-226-6334

UNITED STATES PLASTIC ROPE INC  
VICE PRESIDENT - SALES  
PETER M. LIND  
BRAND NAMES  
GLASTRAN  
COMPANY ADDRESS  
711 HAMILTON AVE.  
MENLO PARK, CALIF. 94025  
415-322-1881

UNITED STATES TOWERS  
OWNER  
JOHN J. HOKE  
COMPANY ADDRESS  
249 BARTOW LANE  
PETERSBURG, VA.  
732-9350

UNITED TRANSFORMER COMPANY  
SALES MANAGER  
J. R. BARRECA  
BRAND NAMES  
CAT  
COMPACT  
OCCOUNCER  
OI-T  
OI-T200  
DO-T  
OO-T400  
HIPERMALLOY  
HIT  
HVC VARIDUCTOR  
HV VARIDUCTOR  
LAB  
LINEAR STANOARD  
MAT  
MET  
MINIDUCTOR  
MINIFILTER  
QUONCER  
PIP  
S SERIES  
SPECIAL SERIES  
SUBOUNCER  
SUB-SUBOUNCER  
TELE-MINIFILTER  
TVC VARIDUCTOR  
ULTRA-COMPACT  
UNITED  
UTC  
VARIDUCTOR  
VARIMATCH  
VARIPOWER  
VARITRAN  
VIC VARIDUCTOR  
PIL  
MAS  
FLATS  
FE  
FI  
FO  
COMPANY ADDRESS  
150 VARICK STREET  
NEW YORK, NEW YORK 10013  
212-AL5-3500

COMPANY REPRESENTATIVES  
CARTFR ASSOCIATES INC  
P O BOX 94  
SCOTTSDALE, ARIZ 85252  
602 947-4355  
RECT ASSOC  
175 S SAN ANTONIO RD  
LOS ALTOS, CALIF  
415 941-0336  
FLARD F STRASSNER  
121 LOS FELIZ BLVD  
LOS ANGELES, CALIF  
213 666-1511  
UTC PACIFIC DIV.  
3631 EASTHAM DRIVE  
CULVER CITY, CALIF  
213 870-9755  
FRANKLIN SALES CO  
2149 SOUTH CLERMONT ST  
DENVER, COLO. 80222  
303 757-1371  
GERBER SALES CO INC  
31 BROADWAY  
NEW HAVEN, CONN 06515  
203 777-6279  
MILLAR-HUTTO ASSOC INC  
P O BOX 1603  
WINTER PARK, FLA 32790  
305 647-7407  
MILLAR-HUTTO ASSOC INC  
1036 PEACHTREE ST N E  
P O BOX 7116, STA C  
ATLANTA, GA 30309  
404 876-0919  
WHITMORE ASSOC  
4750 N MILWAUKEE AVE  
CHICAGO, ILL 60630  
312 286-2442  
LORENZ SALES INC  
320 30TH STREET S E  
CEGAR RAPIOS, IOWA 52403  
319 366-0774  
L D LOWERY INC  
6200 ANNAPOLIS RO  
HYATTSVILLE, MO 20784  
301 773-4977  
GERBRF SALFS CO INC  
176 SECOND AVE  
WALTHAM, MASS 02154  
617 891-8040  
FRED B HILL CO  
6110 EXCELSIOR BLVD  
MINNEAPOLIS, MINN 55416  
612 925-6727  
HARRIS-HANSON CO  
2814 S BRENTWOOD BLVD  
ST LOUIS, MO 63144  
314 647-4350  
FRANK W TAYLOR CO INC  
4455 EAST GENESEE ST  
DEWITT, N Y 13214  
315 446-0422  
COMTRONIC ASSOC  
1551 FRANKLIN AVE  
MINEOLA 11, L I, N Y  
516 741-8966  
BEN MILLER  
P O BOX 72  
LITTLE NECK, N Y 11363  
212 224-4673  
MILLAR-HUTTO ASSOC INC  
112 SO SHARON AMITY RD  
P O BOX 17566  
CHARLOTTE, N C 28211  
704 366-5579  
BEK ASSOC INC  
330 SALEM AVE  
OAYTON, OHIO 45406  
513 278-1343  
L D LOWERY INC  
2801 WEST CHESTER PIKE  
RODMALL, PA 19008  
215 356-5300  
GENE S ROOT & CO  
809 WAINRIGHT DRIVE  
PITTSBURGH, PA 15228  
412 561-6125  
J Y SCHOONMAKER CO INC  
5328 REOFIELD BOX 35266  
DALLAS, TEXAS 75235  
214 631-8480  
J Y SCHOONMAKER CO INC  
6001 GULF FREEWAY  
HOUSTON, TEXAS 77023  
713 926-9510  
JAS. J BACKER CO  
221 WEST GALER ST  
P O BOX 927  
SEATTLE, WASH 98119  
206 283-6470

UP-RIGHT SCAFFOLDS  
SALES MANAGER  
R. L. ESKEN  
BRAND NAMES  
HOLD-E-ZEE  
ROL-TITE  
COMPANY ADDRESS  
65 BROAD STREET  
ROCHESTER, N. Y. 14614  
COMPANY REPRESENTATIVES  
G C RATCLIFF  
1738 E ORANGE DR  
PHOENIX, ARIZ 85016  
602 266-8238  
DONALD E SAVARD CO

UPSON BROTHERS INCORPORATED  
SALES MANAGER  
H. VELEPEC  
BRAND NAMES  
HOLD-E-ZEE  
ROL-TITE  
COMPANY ADDRESS  
65 BROAD STREET  
ROCHESTER, N. Y. 14614  
COMPANY REPRESENTATIVES  
G C RATCLIFF  
1738 E ORANGE DR  
PHOENIX, ARIZ 85016  
602 266-8238  
DONALD E SAVARD CO

426 E VALLEY BLVD  
ALHAMBRA, CALIF 91801  
783-0504  
WILLARD IHLEFELD & ASSOC  
1201 SAN MARCO BLVD  
JACKSONVILLE, FLA 32217  
305 FL 9-282  
ANDERSON SALES CO  
23 W CALENDAR AVE  
LAGRANGE, ILL 60525  
312 FL 2-1514  
F T HARSH CO  
15 FARM HILLS LANE  
HINGHAM, MASS 02043  
617 749-3555  
SIFMERS, GODDEN, OLSON  
324 N FIRST ST  
MINNEAPOLIS, MINN 55401  
612 FE 2-7793  
CHAS H KOSLOWSKY CO  
406 W 34TH ST  
KANSAS CITY, MO 64111  
816 WE 1-8088  
EXPORT AGENCIES CORP  
EXPORT DNLY  
50 BROADWAY  
NEW YORK, N.Y. 10004  
212 WH 4-1141  
HIPKISS & HULBERT INC  
P O BOX 148  
KFMT, OHIO 44240  
216 673-4426  
G W K VOIGHT CO.  
33 W STATE ST  
MEDIA, PA 19063  
215 LO 4-9021  
D R WEFER  
P O BOX 534  
NORRISTOWN, PA 19001  
215 BR 5-4049  
LYNN & HEMPHILL  
2116 N PEARL ST  
OALLAS, TEXAS 75201  
214 RI 7-4745  
KENNETH L SHEPHERD CO  
2830 CANYON VIEW OR  
SALT LAKE CITY, UTAH 84109  
801 HU 4-5408  
DON RAYMOND  
90 S DEARBORN  
SEATTLE, WASH 98104  
206 682-0480  
REPS, IN OTHER COUNTRIES  
LYMAN AGENCIES LTO  
3765 E FIRST AVE  
BURNABY 2, B C  
604 299-7747  
S S LERNER AGENCIES  
137 WELLINGTON ST WEST  
TORONTO, ONTARIO  
416 JU 6-4587

UTICA CORPORATION  
NATIONAL SALES MANAGER  
ARTHUR FRIELICH  
BRAND NAMES  
TOWN & COUNTRY  
T & C  
UTI-COM  
UTI-CAL  
UTICA  
COMPANY ADDRESS  
2947 W. TOUHY AVENUE  
CHICAGO, ILLINOIS 60645  
COMPANY REPRESENTATIVES  
SOUTHWEST MARKETING  
133 E MCLELLAN BLVD  
PHOENIX, ARIZONA  
602 266-5361  
A HERMAN & ASSOC  
6611 SALT LAKE AVE  
BELL, CALIF  
588-1175  
MORTON FIELDS COMPANY  
8330 N SPRINGFIELD  
SKOKIE, ILLINOIS  
312 674-3018  
E O MAGNUS & ASSOC.  
5715 LINCOLN AVE  
CHICAGO, ILL  
312 334-1503  
W F BEYER COMPANY  
538 LONE OAK ROAD  
PAOUCAH, KY  
502 442-1176  
INDUSTRIAL COMPONENT CO  
908 W 46TH ST  
MINNEAPOLIS, MINN  
612 827-1703  
L R MASSEY COMPANY  
304 E JEFFERSON  
GREENWOOD, MISS.  
601 453-3038  
J W LEHNER COMPANY  
367 BRYNHILD ROAD  
COLUMBUS, OHIO  
614 268-5260  
TEX-ELEX  
4222 RICHMOND  
HOUSTON, TEXAS  
713 666-1636

UTILITY PRODUCTS COMPANY  
VICE PRESIDENT - SALES  
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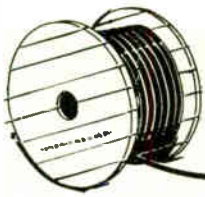
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# Engineering Data

A collection of data selected to be of value to the engineer or technician.

Courtesy Andrew Corporation

## AUDIO NETWORKS

### Unbalanced Configurations

Unbalanced networks encompass the T-type, taper pads, bridged-T, L-type, pi, ladder, and potentiometer.

You will notice, when looking through the network design equations, that the factor  $k$  appears in all equations. The  $k$  factor represents the ratio of current, voltage, or power corresponding to a given value of attenuation expressed in decibels.

To simplify the calculation of attenuator networks, the values of the most frequently used expressions, as tabulated by P. K. McElroy, are given in Table 1. Values for the expressions are substituted in the equations, thus saving much time and resulting in greater accuracy.

It is recommended, when large amounts of attenuation are required, that the loss be divided between two or more attenuator networks. This reduces the possibility of leakage at the higher frequencies and simplifies the construction, because some circuit element values become quite small as the attenuation is increased. As an example, if 80 dB of attenuation is required, it is far more practical to employ two tandem-connected 40-dB pads than to construct one of 80-dB loss. The 80-dB pad would require a shunt resistor of 0.12 ohms for a T-type attenuator, whereas in the 40-dB network it would be 12 ohms.

The given loss of an attenuator can only be obtained when the input and output circuits of the attenuator network are terminated in the design impedance. Although the terms input and output are frequently used in the discussion of attenuators, in reality there is no input or output to an attenuator; it makes no difference to the network which side is connected to the source or terminating circuit as long as the impedance match is satisfied. If a pad designed to operate between 600 ohms and 250 ohms is reversed, the pad will operate; however, the mismatch will cause a loss of level and may result in serious frequency distortion because of the impedance mismatch. The actual loss in decibels, for a given mismatch of impedance, is shown graphically in Fig. 1.

*Material for the section "Audio Networks" has been adapted from the Howard W. Sams book Passive Audio Network Design, by Howard M. Tremaine.*

### T Configuration

A T-configuration network consists of three noninductive resistors, as shown in Fig. 2. T-type networks may be designed to operate between impedances of equal or unequal values. When properly designed, they will present an impedance match to both the source and load impedances regardless of the amount of loss. If the input and output impedance are of the same value, they are designated by the symbol  $Z$ . If they are of unequal values, symbols  $Z_1$  and  $Z_2$  are used. Symbols  $R_1$ ,  $R_2$ , and  $R_3$  are used only with unequal impedances. For equal impedance  $R_1$  appears in both the input and output sides, and the shunt resistor is then designated as  $R_2$  (Fig. 2A). The resistor values for a pad to operate between equal impedances may be calculated:

$$R_1 = \left( \frac{k-1}{k+1} \right) Z$$

$$R_2 = \left( \frac{k}{k^2-1} \right) 2Z$$

where,

$Z$  is the input and output impedance,

$R_1$  is the series resistor,

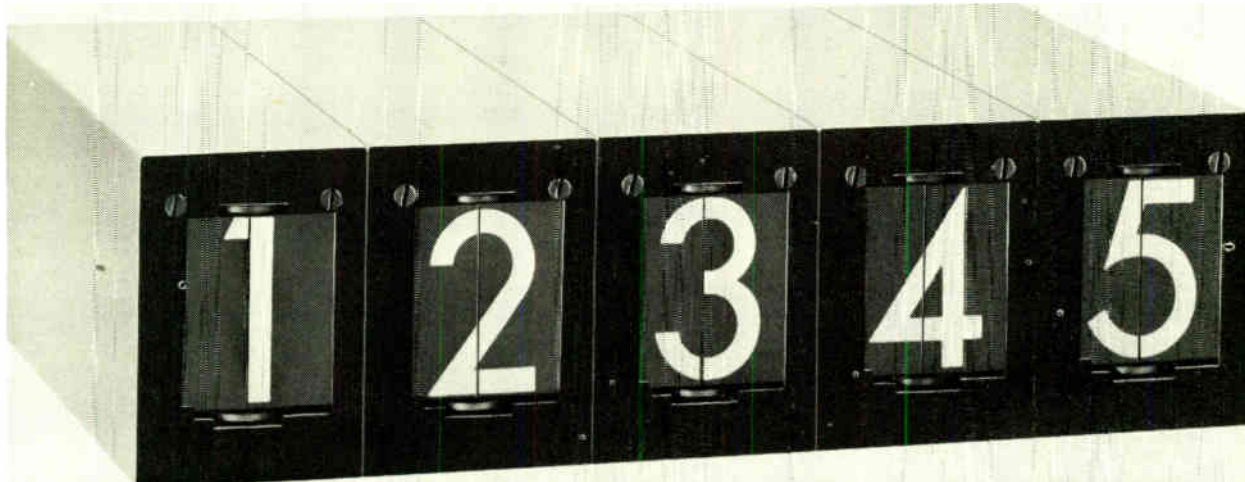
$R_2$  is the shunt resistor.

As an illustration, assume an attenuator is to be designed for a loss of 10 dB and is to operate in a 600-ohm circuit. Referring to Table 1, the  $k$  factor for  $R_1$  at a loss of 10 dB is 0.519, and for  $R_2$  it is 0.351; therefore:

$$\begin{aligned} R_1 &= 0.519 \times 600 \\ &= 311.4 \text{ ohms} \\ R_2 &= 0.351 \times 1200 \\ &= 421.2 \text{ ohms} \end{aligned}$$

Practical construction of this network would require two 310-ohm and one 420-ohm resistors.





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### SPECIFICATIONS:

**Character Description** Maximum of 12 characters; digits 1 through 9, 0 and 2 blank positions supplied on standard unit

**Character Dimensions** Height: 1½ inches  
Width: 1¼ inches

**Unit Dimensions** Height: 2¾ inches  
Width: 2 inches  
Length: 7 inches

**Unit Weight** 1½ lbs.

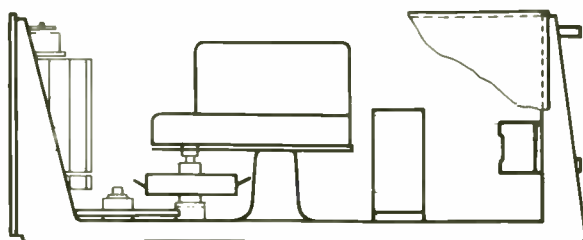
**Power Requirements** Motor: 60 cycle, 115 volts, AC  
Relay: 24 volts, DC

**Operating Power** Maximum of 2.7 watts required

**Operating Speed** Consecutive change:  
0.25 seconds  
Complete 12-step cycle:  
3.0 seconds

**Mounting** Bottom mounting holes:  
2 front, 2 rear

**Connections** Jones Type P-318-AB Connector.



Model 192 Digital Display Control features fail-safe truth circuitry, automatic homing control, and provides positive control of up to 192 DDU-1As. Custom controls for larger systems are available.

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| 41.0  | 0.0089125   | 112.202         | 12,589.                  | 0.98233 | 0.01799 | 0.0089134   | 112.193         | 1.00016  | 0.99109 | 1.00899 | 0.0089926   | 41.0  |
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| 43.5  | 0.0066834   | 149.62          | 22,387.                  | 0.98672 | 1.01346 | 0.0066834   | 149.61          | 1.00009  | 0.99332 | 1.00673 | 0.0067286   | 43.5  |
| 44.0  | 0.0063096   | 158.49          | 25,119.                  | 0.98746 | 1.01270 | 0.0063096   | 158.49          | 1.00008  | 0.99369 | 1.00635 | 0.0063496   | 44.0  |
| 45.0  | 0.0056234   | 177.83          | 31,623.                  | 0.98887 | 1.01131 | 0.0056234   | 177.83          | 1.00006  | 0.99438 | 1.00566 | 0.0056551   | 45.0  |
| 46.0  | 0.0050119   | 199.53          | 39,811.                  | 0.99003 | 1.01007 | 0.0050119   | 199.53          | 1.00005  | 0.99499 | 1.00504 | 0.0050370   | 46.0  |
| 46.5  | 0.0047315   | 211.35          | 44,668.                  | 0.99058 | 1.00951 | 0.0047315   | 211.35          | 1.000045 | 0.99527 | 1.00475 | 0.0047540   | 46.5  |
| 47.0  | 0.0044668   | 223.87          | 50,119.                  | 0.99111 | 1.00897 | 0.0044668   | 223.87          | 1.000040 | 0.99553 | 1.00449 | 0.0044869   | 47.0  |
| 48.0  | 0.0039811   | 251.19          | 63,096.                  | 0.99207 | 1.00799 | 0.0039811   | 251.19          | 1.000032 | 0.99602 | 1.00400 | 0.0039970   | 48.0  |
| 49.0  | 0.0035481   | 281.84          | 79,433.                  | 0.99293 | 1.00712 | 0.0035481   | 281.84          | 1.000025 | 0.99645 | 1.00356 | 0.0035607   | 49.0  |
| 50.0  | 0.0031623   | 316.23          | 100,000.                 | 0.99370 | 1.00634 | 0.0031623   | 316.23          | 1.000020 | 0.99684 | 1.00317 | 0.0031723   | 50.0  |
| 51.0  | 0.0028184   | 354.81          | 125,890.                 | 0.99438 | 1.00565 | 0.0028184   | 354.81          | 1.000016 | 0.99718 | 1.00283 | 0.0028264   | 51.0  |
| 52.0  | 0.0025119   | 398.11          | 158,490.                 | 0.99499 | 1.00504 | 0.0025119   | 398.11          | 1.000013 | 0.99749 | 1.00252 | 0.0025182   | 52.0  |
| 54.0  | 0.0019953   | 501.19          | 251,190.                 | 0.99602 | 1.00400 | 0.0019953   | 501.19          | 1.000008 | 0.99801 | 1.00200 | 0.0019992   | 54.0  |
| 55.0  | 0.0017783   | 562.34          | 316,230.                 | 0.99645 | 1.00356 | 0.0017783   | 562.34          | 1.000006 | 0.99822 | 1.00178 | 0.0017815   | 55.0  |
| 56.0  | 0.0015849   | 630.96          | 398,110.                 | 0.99684 | 1.00317 | 0.0015849   | 630.96          | 1.000005 | 0.99842 | 1.00159 | 0.0015874   | 56.0  |
| 57.0  | 0.0014125   | 707.95          | 501,190.                 | 0.99718 | 1.00283 | 0.0014125   | 707.95          | 1.000004 | 0.99859 | 1.00141 | 0.0014145   | 57.0  |
| 58.0  | 0.0012589   | 794.33          | 630,960.                 | 0.99749 | 1.00252 | 0.0012589   | 794.33          | 1.000003 | 0.99874 | 1.00126 | 0.0012605   | 58.0  |
| 60.0  | 0.0010000   | 1,000.0         | 10 <sup>6</sup>          | 0.99800 | 1.00200 | 0.0010000   | 1,000.0         | 1.000002 | 0.99900 | 1.00100 | 0.0010010   | 60.0  |
| 65.0  | 0.00056234  | 1,778.3         | 3.1623 × 10 <sup>6</sup> | 0.99888 | 1.00112 | 0.00056234  | 1,778.3         | 1.000001 | 0.99944 | 1.00056 | 0.00056265  | 65.0  |
| 70.0  | 0.00031623  | 3,162.3         | 10 <sup>7</sup>          | 0.99937 | 1.00063 | 0.00031623  | 3,162.3         | 1.000000 | 0.99968 | 1.00032 | 0.00031633  | 70.0  |
| 75.0  | 0.00017783  | 5,623.4         | 3.1623 × 10 <sup>7</sup> | 0.99964 | 1.00036 | 0.00017783  | 5,623.4         | 1.000000 | 0.99982 | 1.00018 | 0.00017786  | 75.0  |
| 80.0  | 0.00010000  | 10,000.         | 10 <sup>8</sup>          | 0.99980 | 1.00020 | 0.00010000  | 10,000.         | 1.000000 | 0.99990 | 1.00010 | 0.00010001  | 80.0  |
| 85.0  | 0.000056234 | 17,783.         | 3.1623 × 10 <sup>8</sup> | 0.99989 | 1.00011 | 0.000056234 | 17,783.         | 1.000000 | 0.99994 | 1.00006 | 0.000056237 | 85.0  |
| 90.0  | 0.000031623 | 31,623.         | 10 <sup>9</sup>          | 0.99994 | 1.00006 | 0.000031623 | 31,623.         | 1.000000 | 0.99997 | 1.00003 | 0.000031624 | 90.0  |
| 95.0  | 0.000017783 | 56,234.         | 3.1623 × 10 <sup>9</sup> | 0.99996 | 1.00004 | 0.000017783 | 56,234.         | 1.000000 | 0.99998 | 1.00002 | 0.000017783 | 95.0  |
| 100.0 | 0.000010000 | 10 <sup>6</sup> | 10 <sup>10</sup>         | 0.99998 | 1.00002 | 0.000010000 | 10 <sup>6</sup> | 1.000000 | 0.99999 | 1.00001 | 0.000010000 | 100.0 |

(Courtesy Proceedings of the IRE.)

Taper Configuration

A taper pad is a T configuration (Fig. 2B) designed to operate between two circuits of unequal impedance. In this instance the symbols for the impedances become  $Z_1$  and  $Z_2$ , with  $Z_1$  being the larger of the two. The resistor values may be equated:

$$R_1 = Z_1 \left( \frac{k^2 + 1}{k^2 - 1} \right) - 2\sqrt{Z_1 Z_2} \left( \frac{k}{k^2 - 1} \right)$$

$$R_2 = Z_2 \left( \frac{k^2 + 1}{k^2 - 1} \right) - 2\sqrt{Z_1 Z_2} \left( \frac{k}{k^2 - 1} \right)$$

$$R_3 = 2\sqrt{Z_1 Z_2} \left( \frac{k}{k^2 - 1} \right)$$

As an example, assume a taper pad is to be designed to operate between a 500- and 250-ohm impedance, with a loss of 20 dB. First, it must be determined if a pad of 20-dB loss can be designed for an impedance ratio of two. This is determined by referring to the graph in Fig. 3. Entering the graph at the bottom, at a ratio of two, and following the line up to where it intersects the diagonal line, the minimum loss is read on the left margin as 7.8 dB. Therefore, the pad may be constructed without difficulty. If the desired loss was to be on

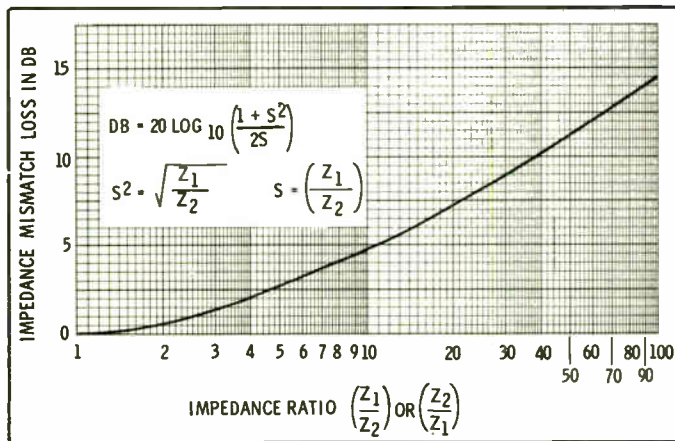


Fig. 1. Loss in level because of impedance mismatch.

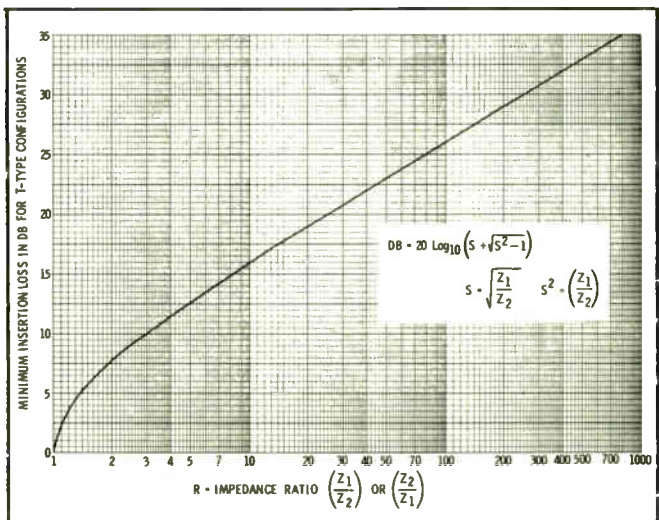


Fig. 3. Minimum loss chart for networks of unequal impedances.

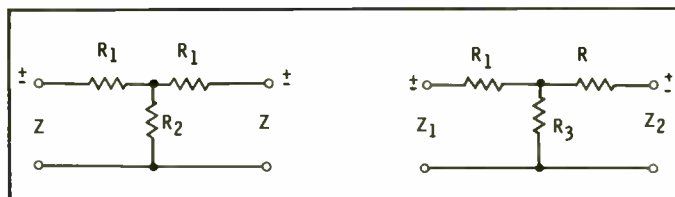


Fig. 2. Symbols used in the design of T-configuration networks.

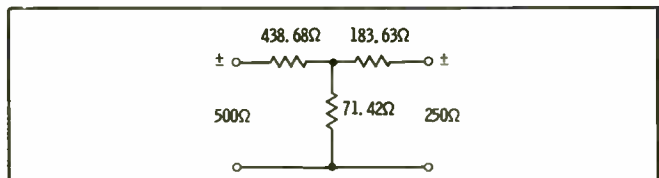


Fig. 4. Connections and circuit-element values for a 500- to 250-ohm taper pad with a 20-dB insertion loss.

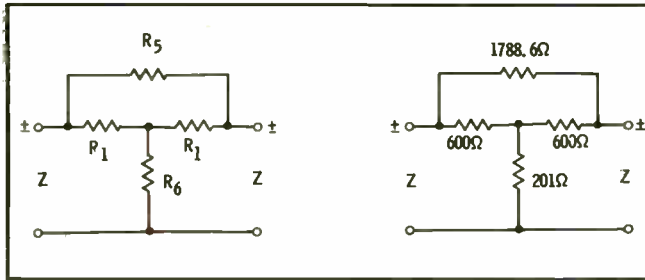


Fig. 5. Symbols and circuit-element values for a 600-ohm bridged-T attenuator with a 12-dB insertion loss.

the order of 6 dB, it could not be designed for such a loss. Using Table 1, the resistor values may now be calculated:

$$\begin{aligned} R_1 &= 500(1.0202) - 2(\sqrt{125,000}) \times 0.10101 \\ &= 510.1 - 2(353.55) \times 0.10101 \\ &= 510.1 - 71.42 \\ &= 438.68 \text{ ohms} \end{aligned}$$

$$\begin{aligned} R_2 &= 250(1.0202) - 2(\sqrt{125,000}) \times 0.10101 \\ &= 255.05 - 2(353.55) \times 0.10101 \\ &= 255.05 - 71.42 \\ &= 183.63 \text{ ohms} \end{aligned}$$

$$\begin{aligned} R_3 &= 2(\sqrt{125,000}) \times 0.10101 \\ &= 2(353.55) \times 0.10101 \\ &= 71.42 \text{ ohms} \end{aligned}$$

Practical values for the resistors would be 440, 185, and 72 ohms. The resistors are connected as shown in Fig. 4. If the 500-ohm side of the network is terminated in 500 ohms and an ohmmeter is connected across the 250-ohm side, the internal resistance will measure 250 ohms; when the procedure is reversed, the 500-ohm side will measure 500 ohms.

**Bridged-T Configuration**

The bridged-T attenuator is quite similar to the basic T network. The only difference in the configuration is the addition of the bridging resistor (R5), as shown in Fig. 5A. However, a bridged-T attenuator may only be used between circuits of equal impedance. In this network there are two resistors designated as R1, each resistor having a value equal to the line impedance; hence these values are known. This leaves only the bridging resistor (R5) and the shunt resistor (R6) to be determined. They are calculated as follows:

$$R_5 = (k - 1) Z$$

$$R_6 = \left( \frac{1}{k - 1} \right) Z$$

Assume that a bridge-T pad of 12-dB loss to work in a 600-ohm line circuit is to be designed. R1 will automatically equal 600 ohms. Solving for R5:

$$\begin{aligned} R_5 &= (3.981 - 1) \times 600 \\ &= 2.981 \times 600 \\ &= 1788.6 \text{ ohms} \end{aligned}$$

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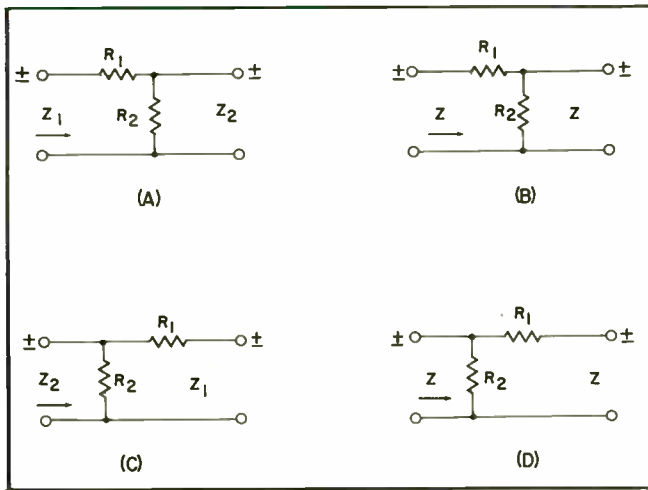


Fig. 6. L-type configurations.

Solving for  $R_2$ :

$$R_2 = 0.335 \times 600 = 201 \text{ ohms}$$

For this problem, the first  $k$  factor was taken from column three and the second factor from column 12 of Table 1. The resistors are connected as shown in Fig. 5B.

**L Configuration**

An L configuration consists of two circuit elements connected to form an inverted letter L. Actually there are four variations of this basic configuration, as shown in Fig. 6. An L-type attenuator has a minimum loss like the taper pad described previously. L-type attenuators cannot be designed to reflect an impedance match in both directions, only in the direction indicated by the arrows in the illustrations.

If an L-type network is inserted into a circuit that is impedance sensitive, the circuit characteristics could be affected. L configurations should not be used, except when a minimum loss that cannot be satisfied by a T-type configuration is required. The minimum loss for an L-type network may be determined from the graph in Fig. 7. The procedure for using this graph is the same as described for the T configuration in Fig. 3.

For unequal impedances the match may be in the direction of the larger or smaller impedance, but not both, as shown in Figs. 6A and C. When an L-type network is connected to circuits of equal impedance (Figs. 6B and D), the circuits are matched in one direction, but not in the other. However, the network may be designed to match either of the terminating impedances.

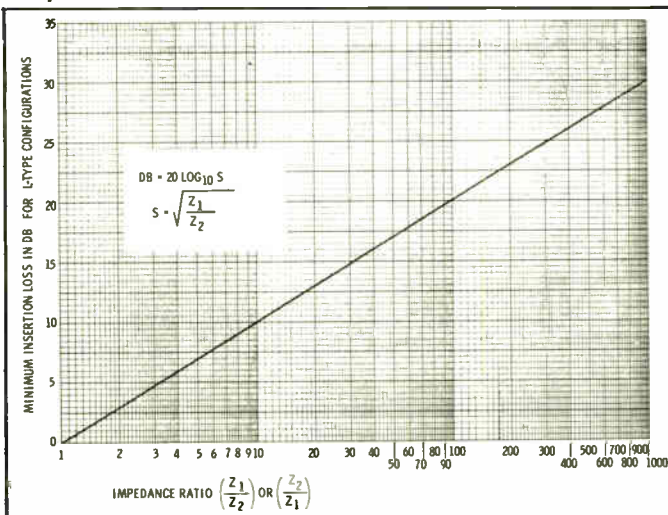


Fig. 7. Minimum loss graph for L-type attenuators.

The arrows in the illustrations indicate the direction of the impedance match. If the network is designed to match the impedance in the direction of the series resistor, the mismatch is always toward the shunt resistor. Impedance mismatch increases with an increase of loss. In some instances the ohmic value of the shunt resistor may become a fraction of an ohm, which can seriously affect the circuit in which it has been connected.

The configuration for an L-type network operating between unequal values of impedances ( $Z_1$  and  $Z_2$ ) is shown in Fig. 6A. Here the impedance match is toward the larger of the two ( $Z_1$ ). The values of the resistors may be equated:

$$R_1 = \left( \frac{Z_1}{S} \right) \left( \frac{kS - 1}{k} \right)$$

$$R_2 = \left( \frac{Z_1}{S} \right) \left( \frac{1}{k - S} \right)$$

where,

$$S = \sqrt{\frac{Z_1}{Z_2}}$$

For a condition where the impedances are equal and the impedance match is in the direction of the arrow (Fig. 6B), the values of the resistors are calculated:

$$R_1 = \left( \frac{k - 1}{k} \right) Z$$

$$R_2 = \left( \frac{1}{k - 1} \right) Z$$

If the impedances are unequal, and the impedance match is toward the smaller of the two impedances (Fig. 6C), the values of the resistors are determined by:

$$R_1 = \left( \frac{Z_1}{S} \right) (k - S)$$

$$R_2 = \left( \frac{Z_1}{S} \right) \left( \frac{k}{kS - 1} \right)$$

where,

$$S = \sqrt{\frac{Z_1}{Z_2}}$$

When the impedances are equal and the impedance match is in the direction of the shunt arm (Fig. 6D), the resistors are calculated by the following:

$$R_1 = (k - 1) Z$$

$$R_2 = \left( \frac{k}{k - 1} \right) Z$$

When selecting an L configuration, due consideration should be given to the effect it may have on the circuit into which it is to be connected. For example, if the series resistor is around 600 ohms, the shunt resistor approximately 60 ohms, and the configuration is used as an input or output termination for a transformer of an amplifier, there is no doubt that the frequency and distortion characteristics of the amplifier would be adversely affected. If the equipment terminated by the 60 ohms should happen to be a filter or equalizer, the frequency characteristics of these units would be *seriously* affected. Therefore, before considering the use of the L-type network, due consideration should be given to the effect on the circuit into which the network is to be connected.

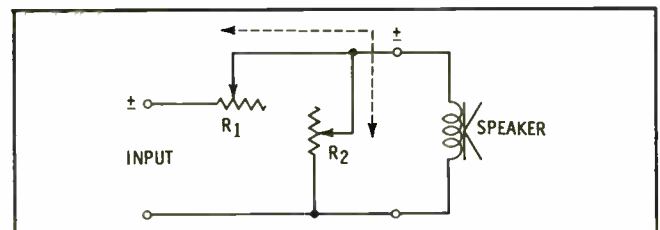


Fig. 8. L-type configuration used as speaker volume control.

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## Engineering Data

The question then arises as to why the L-type configuration is used at all. Contrary to the disadvantages of the L-type network, it does have certain advantages if employed in a circuit such as a volume control, voltage divider, volume indicator meter attenuator (multiplier), or in any circuit where the impedance match is not of great importance. However, the L-attenuator network cannot be employed for the VU meter; this instrument must see a constant impedance of 3,900 ohms.

The circuit for a speaker volume control using an L pad is given in Fig. 8. It will be observed, the series resistor of the network is toward the output of the amplifier. Mechanically, the two arms are mounted on a common shaft, and  $R_1$  and  $R_2$  are varied inversely with respect to each other.

### Pi Configuration

The pi configuration, sometimes referred to as a delta pad (Fig. 9), may be designed to operate between equal or unequal impedances, balanced or unbalanced. The pi attenuator is not usually found in commercial sound installations, but it is used quite extensively in the telephone industry. The resistance values for impedance of *equal* values (Fig. 9A) may be calculated with the following formulas:

$$R_1 = \left( \frac{k + 1}{k - 1} \right) Z$$

$$R_2 = \left( \frac{Z}{2} \right) \left( \frac{k - 1}{k} \right)$$

where,

- $R_1$  is the series resistor,
- $R_2$  is the shunt resistor,
- $Z$  is the input and output impedance.

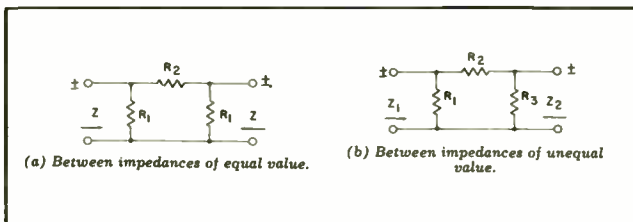


Fig. 9. Pi-type configurations.

For impedances of *unequal* values (Fig. 9B), the resistor values may be determined by the formulas:

$$R_1 = \left( \frac{k^2 - 1}{k^2 - 2kS + 1} \right) Z$$

$$R_2 = \left( \frac{\sqrt{Z_1 Z_2}}{2} \right) \left( \frac{k^2 - 1}{k} \right)$$

$$R_3 = \left( \frac{k^2 - 1}{k^2 - 2\frac{k}{S} + 1} \right) Z_2$$

where,

- $R_1$  and  $R_3$  are the shunt resistors,
- $R_2$  is the series resistor,
- $Z_1$  is the input impedance,
- $Z_2$  is the output impedance,

$S$  is equal to  $\frac{\sqrt{Z_1}}{\sqrt{Z_2}}$

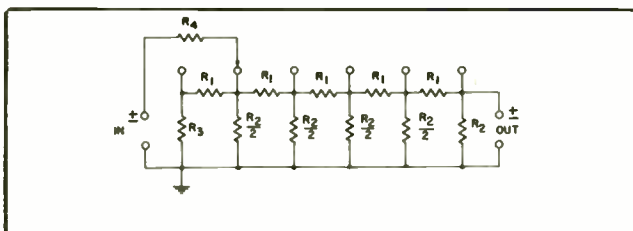


Fig. 10. Configuration for a ladder-type sound-mixer control.

### Ladder Configuration

The ladder configuration consists of a group of pi pads connected in tandem; it is designed to operate between impedances of the same value. Attenuators using this configuration, which are only manufactured in variable form, are used extensively for sound-mixer controls.

One disadvantage of the ladder-type configuration (Fig. 10) is that it has a fixed insertion loss of 6 dB. This 6-dB loss is exclusive of the variable attenuation. The insertion loss is caused by the series and shunt resistors and the resistor in the slide-arm circuit. The 6-dB loss is divided as follows: 3.5 dB in the ladder network resistors ( $R_1, R_2,$  and  $R_3$ ) and 2.5 dB in the series resistor ( $R_4$ ).

Another disadvantage of the ladder configuration is that the impedance is not constant over the entire operating range; however, this is of no great consequence since it occurs at the maximum and minimum loss positions. In a sound mixer the controls are fed into a combining network which prevents the slight mismatch of the impedances from being reflected to the output of the mixer.

Ladder networks have better attenuation characteristics, allowing virtually an infinite cutoff to about 120 dB of loss; whereas the T type extends downward in the order of 100 dB. The advantages of the ladder configuration are: (1) as the attenuation is increased the contact noise decreases in proportion (contact noise remains constant with the T type), and (2) impedance mismatch effects decrease in a direct proportion to the number of controls in a mixer-combining network. (With four controls the impedance mismatch is negligible.) The values for the components of a ladder configuration may be calculated:

$$R_1 = \left( \frac{k^2 - 1}{2k} \right) Z$$

$$R_2 = \left( \frac{k + 1}{k - 1} \right) Z$$

$$R_3 = \frac{R_2 \times Z}{R_2 + Z}$$

$$R_4 = \frac{Z}{2}$$

where,

- $R_1$  is the series resistor,
- $R_2$  is the shunt resistor,
- $R_3$  is the input shunt resistor,
- $R_4$  is the series resistor in the contact arm,
- $Z$  is the impedance.

*Note:* The value of  $k$  is dependent on the loss per step and not the total loss. The loss per step should not exceed 1.3 dB. Also, the value of  $R_2$  is halved for all but the output shunt resistor.

Ladder attenuators must be grounded at the low-potential side to prevent leakage at the higher frequencies.

### Minimum-Loss Configuration

A minimum-loss pad is a network designed to operate between circuits of *unequal* impedance with a *minimum* insertion loss for a given impedance ratio. Minimum-loss ratios are given for L-type configurations in Fig. 7, and for the T configuration in Fig. 3. However, for those desiring to solve the minimum loss mathematically, the L pad may be calculated:

$$\text{dB} = 20 \log_{10} (S)$$

where,

$$S = \frac{\sqrt{Z_1}}{\sqrt{Z_2}}$$

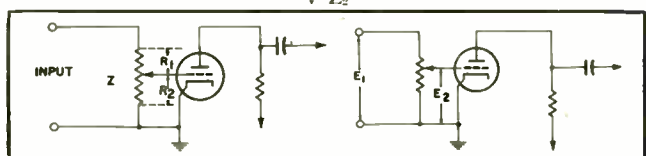


Fig. 11. Grid-circuit potentiometers.



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## Engineering Data

For the T (taper-pad) configuration:

$$\text{dB} = 20 \log_{10} (S + \sqrt{S^2 - 1})$$

$$S^2 = \frac{Z_1}{Z_2}$$

where,

$Z_1$  and  $Z_2$  are the input and output impedances,  $Z_1$  being the larger of the two.

### Grid-Circuit Potentiometers

A grid-circuit potentiometer (abbreviated pot) is actually an L-type configuration and is used primarily for controlling the gain in a circuit where the load on the slider or unmatched side is practically an open circuit, such as the control grid of a vacuum tube (Fig. 11). The total resistance of such controls varies from 50,000 ohms to 1 megohm or greater. To illustrate the design procedure, assume a potentiometer having a resistance of 100,000 ohms with a total attenuation of 30 dB in steps of 10 dB is required. It will be noted in Fig. 11A that the upper portion of the control is designated as  $R_1$  and the lower portion  $R_2$ . Therefore:

$$R_1 = \left(\frac{1}{k}\right) Z$$

$$R_2 = (Z - R_1)$$

where,

$Z$  is the total resistance of the potentiometer,  
 $R_1$  and  $R_2$  are the upper and lower portions of the resistance, depending on the position of the slider arm.

The factor  $(1/k)$  is taken from Table 1. Solving for the first 10-dB step:

$$\begin{aligned} R_1 &= 0.3162 \times 100,000 \\ &= 31,620 \text{ ohms} \\ R_2 &= 100,000 - 31,620 \\ &= 68,380 \text{ ohms} \end{aligned}$$

the second step (20 dB):

$$\begin{aligned} R_1 &= 0.100 \times 100,000 \\ &= 10,000 \text{ ohms} \\ R_2 &= 100,000 - 10,000 \\ &= 90,000 \text{ ohms} \end{aligned}$$

and the third step (30 dB):

$$\begin{aligned} R_1 &= 0.03162 \times 100,000 \\ &= 3,162 \text{ ohms} \\ R_2 &= 100,000 - 3,162 \\ &= 96,838 \text{ ohms} \end{aligned}$$

Taps will occur at 3,162 ohms, 10,000 ohms, and 31,620 ohms, upward from ground. The final design will consist of four resistors of 3,162, 6,838, 21,620, and 68,380 ohms for a total of 100,000 ohms. The resistors may consist of four carbon or wire-wound noninductive resistors, mounted on a switch frame.

Potentiometers may also be calibrated to indicate in terms of voltage, as shown in Fig. 11B. The voltage for any position may be computed:

$$E_2 = E_1 \left( \frac{R_1}{R_1 + R_2} \right)$$

Table 2. Work Sheet for Calculating Resistor Values

| Loss | $k-1$  | $R_5$<br>(Ohms) | $\frac{1}{k-1}$ | $R_6$<br>(Ohms) |
|------|--------|-----------------|-----------------|-----------------|
| 0    | —      | Zero            | —               | Infinite        |
| 1    | 1.122  | 30.5            | 8.195           | 2048.7          |
| 2    | 1.258  | 64.5            | 3.862           | 965.5           |
| 4    | 1.584  | 146.0           | 1.700           | 425.0           |
| 6    | 1.995  | 248.0           | 1.004           | 221.0           |
| 10   | 3.162  | 540.5           | 0.462           | 115.5           |
| 15   | 5.623  | 1155.8          | 0.216           | 54.0            |
| 20   | 10.000 | 2250.0          | 0.111           | 27.8            |
| 25   | 17.783 | 4200.0          | 0.059           | 14.8            |
| 30   | 31.623 | 7650.0          | 0.0326          | 8.15            |

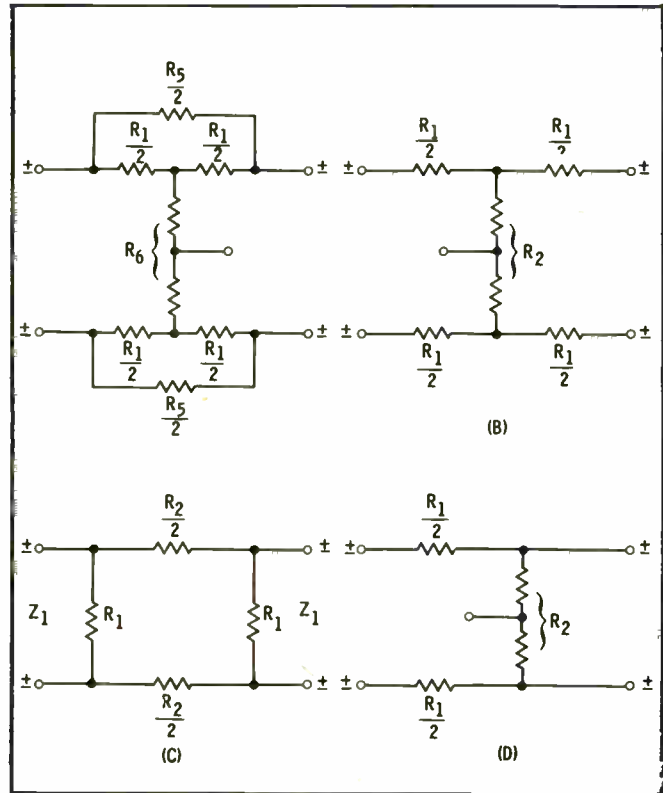


Fig. 12. Balanced networks.

As a rule, nonprofessional equipment uses potentiometers ranging from 100,000 ohms to 1 megohm in resistance. However, it is the practice in commercial equipment to keep the overall resistance to 50,000 ohms or less. To insure calibration accuracy, such controls are operated in the control grid of an amplifier stage, biased for class-A operation. In choosing the resistance value of a potentiometer, several factors must be considered. For example, if the control is to be used in the input of a high-gain triode, where the input impedance of the tube may be quite low at the higher frequencies, a low value of resistance is required. In addition, the input capacity to ground has a marked effect on the attenuation of the high frequencies; therefore, the lower the value of the potentiometer, the smaller this effect becomes. If grid current is permitted to flow in the input of a tube, the potentiometer will generate noise each time it is changed. Whenever possible, an input transformer with a potentiometer connected across the secondary of the transformer is recommended. When connected across a transformer, the potentiometer resistance is usually made equal to the secondary impedance of the transformer.

### Variable Attenuator Design

In reality the design of a variable attenuator consists of designing a group of fixed attenuators that may be switched in and out of a circuit at will. Before starting a design, the impedance and configuration are selected. A table similar to that shown in Table 2 is prepared, and the desired values of loss,  $k$ -factors, and the calculated values of resistances are then entered in the appropriate column.

Assume a bridged-T attenuator of 250 ohms impedance, having a total loss of -30 dB which is variable in steps of 1 dB, is to be designed, using the equations given under the heading "Bridge-T Configuration." The value of  $k$  is taken from Column 3 and the value of  $1/k - 1$  from Column 12 of Table 1. Since  $R_1$  equals the 250-ohm line impedance, only  $R_5$  and  $R_6$  require calculation. For the sake of brevity, only nine of the loss steps have been calculated in Table 2.

It should be noted at the zero-loss position,  $R_5$  has zero resistance and  $R_6$  is infinite. In practice, at zero attenuation a high value of resistance is switched in  $R_6$  to keep the circuit closed and to prevent contact noise. The value of the resistance depends on the impedance and loss of the network, but it should be of such a value that the pad is effectively out of the circuit.

The resistors are noninductively wound and mounted on a switch frame, with or without a detent. If possible, the entire unit should be mounted in a metal case to prevent damage to the resistors and reduce the possibility of pickup from extraneous electrical fields. The two switch arms are mounted on a common shaft, and the resistors are inserted inversely to each other, as for the L-type network. If over 40 dB of attenuation is required, the resistor coils must be carefully placed to reduce the possibility of leakage at the higher frequencies.

Variable attenuators can also be designed to match two impedances of unequal value, using a taper network as discussed under the heading "Taper Configuration." Such networks, however, are the exception rather than the rule. The procedure for their design is the same as for the equal-impedance network described previously.

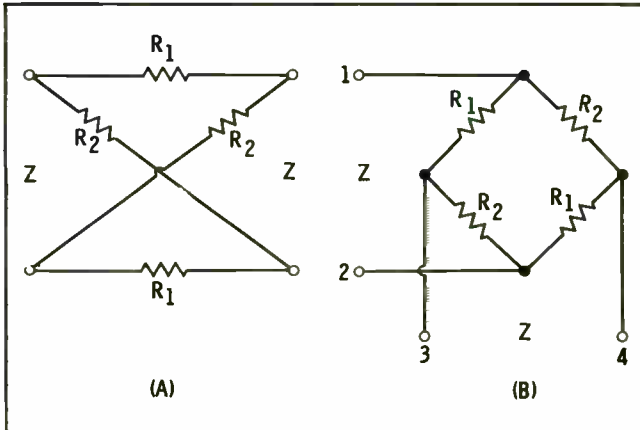


Fig. 13. Lattice network and its equivalent circuit.

### Balanced Configurations

Basically a balanced configuration consists of designing an unbalanced network, dividing the values of the series resistors in half, and connecting the halves on each side of the configuration. Balanced configurations include the bridged-T, H, O, U, lattice, and ladder networks. If the network is to be grounded, the shunt resistor is tapped in the exact electrical center and connected to ground. It will be noted that only the values of series resistors are divided; the shunt resistor remains as for the unbalanced network.

#### Bridged-T, H, O, and U Configurations

The balanced bridged-T configuration is given in Fig. 12A. Here you will notice that series resistors  $R_1$  (equal to the line impedance) are divided and connected in each side of the configuration. Resistor  $R_2$  is treated in the same manner. The value of  $R_2$  remains the same as for the unbalanced configuration, except that a tap has been added for the ground connection. For ease in winding,  $R_2$  may be made into two separate resistors connected in series. The balanced configuration will exhibit the same characteristics as the unbalanced version.

The balanced T, or H pad as it is commonly known, is shown in Fig. 12B. Like the bridged-T, its series resistors are divided and connected in each half of the configuration. Except for being balanced, the H pad is similar in all other respects to the T configuration. H-type configurations may be designed for matching impedances of unequal value, as described for the taper pad.

The O configuration (Fig. 12C) is in reality a balanced pi pad. The addition of one resistor converts the pi pad into a balanced configuration. Only the series resistors ( $R_2$ ) are divided. Resistors  $R_1$  remain as for the pi pad. This configuration does not adapt itself to grounding; however, it may be used in any circuit where a balanced to ground pad is employed, or in a symmetrical circuit free from ground. The O network may be designed for circuits of equal or unequal impedances.

U pads (Fig. 12D) are balanced L configurations. The rules for impedance matching for the L configuration apply equally for the balanced U configuration.

#### Lattice Configuration

The lattice network is a true balanced configuration. Therefore individual treatment is required for solving its circuit element values. If it is used in an unbalanced configuration, it degenerates into a pi configuration.

The configuration for the lattice network is shown in Fig. 13A. The difference between this network and the O configuration is that the shunt resistors ( $R_2$ ) are crossed over and connected to both the input and output circuits. The circuit element values may be calculated:

$$R_1 = \left( \frac{k - 1}{k + 1} \right) Z$$

$$R_2 = \left( \frac{k + 1}{k - 1} \right) Z$$

where,

- $R_1$  is the series resistor,
- $R_2$  is the shunt resistor,
- $Z$  is the line impedance.

Lattice networks can only be employed in ungrounded circuits of equal impedance.

If an equivalent circuit is drawn for the lattice pad (Fig. 13B), it resembles a balanced bridge circuit. The principal difference is that resistors  $R_1$  are lower in value than  $R_2$ . This difference unbalances the bridge and permits the signal to pass attenuated in an amount controlled by the ratio of resistors  $R_1$  and  $R_2$ .

#### Ladder Configuration

It was mentioned earlier that the ladder configuration is only manufactured in the variable form and that it is used extensively in sound-mixer circuits. Ladder networks may also be designed for balanced operation. This is accomplished by connecting two unbalanced networks side by side as shown in Fig. 14. However, the circuit elements do not divide in the same manner as for other networks. If the unbalanced configuration in Fig. 10 is compared with the balanced network of Fig. 14, it will be observed that resistors  $R_1$  are divided by two, but resistors  $R_2$  are no longer  $R_2/2$ ; instead,  $R_2$  is now twice the value at the output as for the unbalanced configuration.  $R_2$  remains at its original value each side of ground.

#### Bridging Configurations

A bridging (paralleling) pad is a special type of attenuator network designed to bridge one circuit while feeding another, without disturbing the impedance or frequency characteristics of the circuit bridged. In addition, the network can absorb only a fractional amount of power from the circuit bridged.

Two such networks are shown in Fig. 15. Fig. 15A is an unbalanced-L configuration. The difference between this configuration and the normal L configuration is that at the input side of the bridging pad ( $Z_1$ ) the impedance is very high (10,000 to 30,000 ohms) while the other side ( $Z_2$ ) matches the input impedance of the device being fed by the pad.

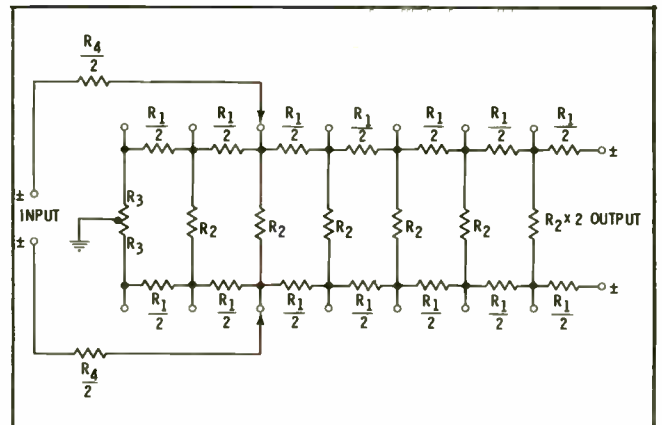


Fig. 14. A balanced ladder network.

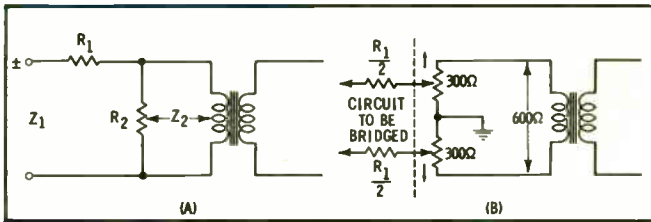


Fig. 15. Bridging input networks.

The loss of a bridging pad is stated for a given set of conditions; e.g., 40 dB of loss when bridging a 600-ohm circuit and feeding a 600-ohm circuit. If either the impedance bridged or series resistor  $R_1$  is changed in value, the insertion loss of the pad will change. Resistor values for the more commonly used pads and insertion losses are given in Table 3. The stated loss of these networks will only be valid when they are bridging 600 ohms and feeding 600 ohms. The loss for the same configuration, but using other values of  $R_1$  and impedance  $Z_2$ , may be equated:

$$dB = 10 \log_{10} \left( \frac{Z_1}{Z_2} \right) + 20 \log_{10} \sqrt{\frac{Z_1}{Z_2}} + \sqrt{\frac{Z_1}{Z_2}} - 1$$

where,

$Z_1$  is the impedance of the circuit to be bridged,  
 $Z_2$  is the impedance of the circuit fed by the network.

Bridging networks should be designed to have an input resistance of at least ten times that of the circuit to be bridged.

The configuration in Fig. 15A may be converted to a balanced network by dividing resistor  $R_1$  by two and placing half in each side of the configuration. A variable 30,000- to 600-ohm pad is shown in Fig. 15B.

When a bridging pad is connected across a circuit, a slight loss of level (usually ignored) takes place in the circuit being bridged. However, this loss may be computed:

$$dB = 20 \log_{10} \frac{2B_R + R}{2B_R}$$

where,

$B_R$  is the bridging input of the pad,  
 $R$  is the impedance of the circuit bridged.

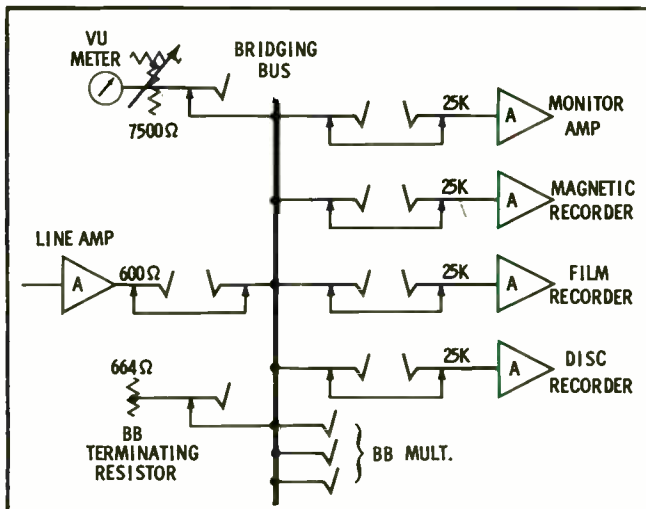


Fig. 16. A typical bridging-bus circuit.

Thus, for a pad of 10,000 to 600 ohms, bridged across a circuit of 600 ohms, the loss is

$$\begin{aligned} dB &= 20 \log_{10} \frac{20,000 + 600}{20,000} \\ &= 20 \log 1.03 \\ &= 20 \times 0.013 \\ &= 0.26 \text{ dB} \end{aligned}$$

Therefore, when a bridging pad of 10,000 ohms is connected across a circuit impedance of 600 ohms, the level in the 600-ohm circuit will drop 0.26 dB.

When the bridging pad is connected across a 600-ohm circuit, the impedance of the 600-ohm circuit will be lowered only 1 to 3%. This impedance reduction is of small consequence. This is the principal reason for using a bridging impedance of 20,000 to 30,000 ohms, although it may insert a considerable amount of loss. If the insertion loss of a bridging pad is too great, it may be replaced with a bridging transformer which has an insertion loss of 18 to 20 dB; however, if sufficient gain is available, the pad is the most economical.

A typical recording or broadcast studio-type bridging bus is shown in Fig. 16. The purpose of a bridging bus is to provide a circuit in the system where additional equipment may be connected. The bridging-bus circuit is a group of jacks connected in parallel and driven by an amplifier. It will be observed that the bridging bus and the equipment connected across the bus act as a load impedance for the amplifier driving the bus. The first step in bus-circuit design is to decide how many pieces of equipment will be permanently connected (normalled) across the bus.

For this illustration four bridging impedances of 25,000 ohms and a 7,500-ohm VU meter have been selected. A terminating resistor and three sets of bridging-bus multiple jacks for patching additional equipment are connected in parallel with the bridging bus. It will be assumed that any additional equipment to be patched across the bus will have a bridging impedance of at least 25,000 ohms and that the output impedance of the amplifier driving the bus is 600 ohms. First, the total impedance of the equipment permanently connected across the bus (exclusive of the bridging-bus termination) is determined. The four 25,000-ohm bridging inputs connected across the bus present a load resistance of 6,250 ohms. In parallel with this is the 7,500-ohm VU meter panel. Using Ohm's law for parallel circuits:

$$\begin{aligned} R_t &= \frac{6,250 \times 7,500}{6,250 + 7,500} \\ &= \frac{4.68 \times 10^7}{13.75} \\ &= \frac{4.68 \times 10^7}{1.37} \\ &= 3,416 \text{ ohms} \end{aligned}$$

The next step is to determine the value of the bridging-bus terminating resistor which, when connected in parallel with 3,416 ohms, will reflect an impedance of 600 ohms. Again using Ohm's law for parallel resistors:

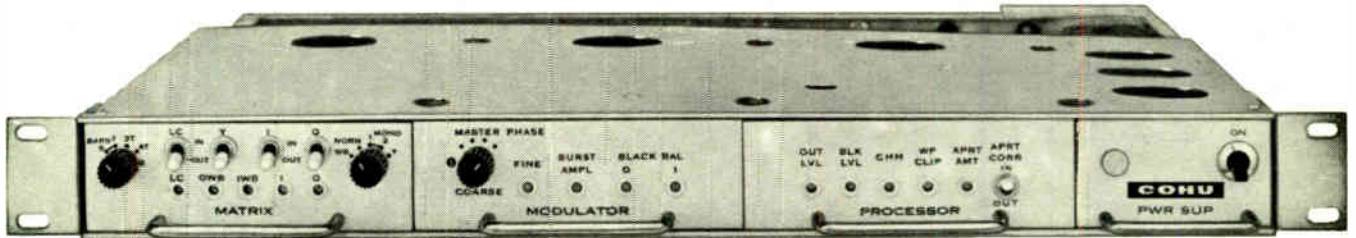
$$\begin{aligned} BB &= \frac{3,416 \times 600}{3,416 - 600} \\ &= \frac{2.05 \times 10^6}{2.81} \\ &= \frac{2.05 \times 10^6}{2.81} \\ &= 729.53 \text{ ohms} \end{aligned}$$

Therefore, if the resistor of 729.53 ohms is connected in parallel with the bus and the foregoing load impedances, the amplifier will see 600 ohms.

Table 3. Resistor Values for Bridging Attenuators

| $R_1$<br>(Ohms) | Loss<br>(dB) | $R_2$<br>(Ohms) |
|-----------------|--------------|-----------------|
| 30,000          | 40.1         | 600             |
| 25,000          | 38.5         | 600             |
| 20,000          | 36.8         | 600             |
| 15,000          | 34.2         | 600             |
| 10,000          | 30.7         | 600             |
| 7,500           | 28.3         | 600             |
| 5,000           | 24.9         | 600             |
| 3,000           | 20.8         | 600             |

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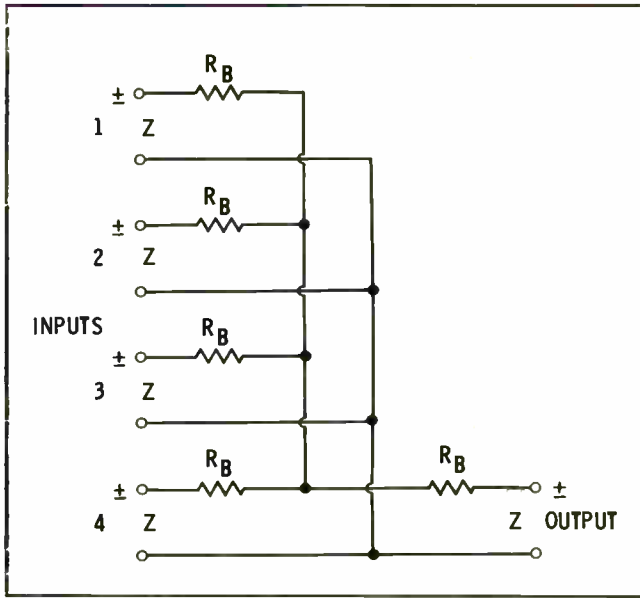


Fig. 17. A four-position combining network.

As a rule it is safe to load the output of a well designed amplifier to within 90% of its rated output impedance, which would be 540 ohms for a 600-ohm output impedance. This means that several more pieces of equipment could be patched across the bus without affecting the amplifier characteristics. If the bridging impedance is greater than 25,000 ohms, more equipment could be driven from the bus. Usually the bus impedance is set for around 625 ohms to permit additional equipment to be patched across the bus without loading the amplifier below 600 ohms.

If the bus is grounded on one side, unbalanced configurations are used. If the bus is balanced to ground or symmetrical, a balanced-type network is used. Standard bridging impedances used by the recording and broadcast industries include 7,500, 10,000, 25,000, and 30,000 ohms.

**Combining Networks**

Combining networks are employed to combine the inputs of several devices or lines. One of the most common uses for this type of configuration is in a sound-mixer circuit. Combining networks may be balanced or unbalanced, and they are usually confined to a common value of impedance.

The signal may consist of dialogue, music, and/or sound effects. The source may be a broadcast line, photographic film, or magnetic tape reproducers, phonograph records, a live pick-up, or a combination of all. The network must be designed so that changing the level of any one of the inputs has no effect on the level or frequency characteristics of the other signal sources. For broadcast and recording at least 10 positions are

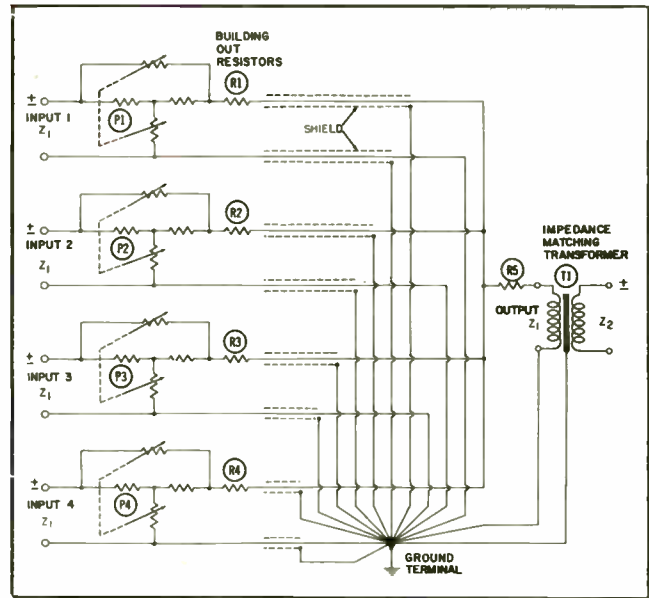


Fig. 18. A four-position, parallel-connected, unbalanced mixer network.

required; in many instances 20 or more are necessary. For recording purposes, equalizers, filters, and other devices are operated in conjunction with the combining networks, as shown in Fig. 17. The network consists of 5 resistors, designated as  $R_n$ . If the circuit is traced, it will be apparent that the five circuits are in parallel. The resistors provide isolation between the four input circuits and an impedance match for the four inputs and the output circuit. The value of the building-out resistors ( $R_n$ ) may be calculated:

$$R_n = \left( \frac{N - 1}{N + 1} \right) Z$$

where,

- $R_n$  is the building-out resistor,
- $N$  is the number of input circuits,
- $Z$  is the circuit impedance.

The loss of the network through any two branches is:

$$20 \log_{10} (N - 1)$$

where,

$N$  is the total number of circuits (4 inputs and 1 output).

Using this equation, the loss for a four-position network is 12 dB. Unused circuits of a combining network must be terminated in a resistive load that is equal to the normal terminating impedance. This type of combining network is often used in sound mixers similar to the one shown in the schematic diagram of Fig. 18.

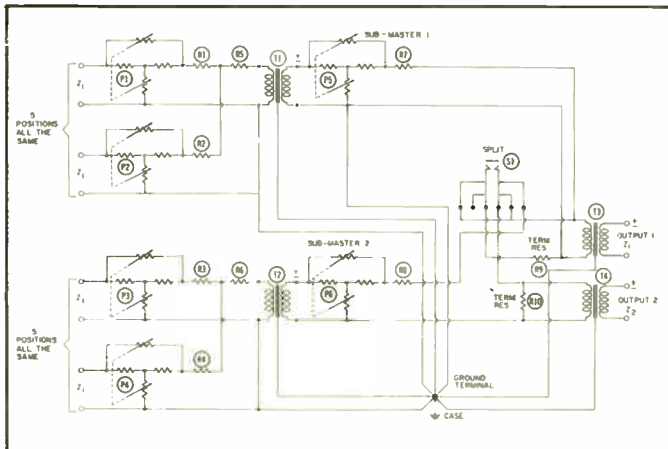


Fig. 19. A 10-position, split mixer network with keyswitch for combining the two sections into a single network.

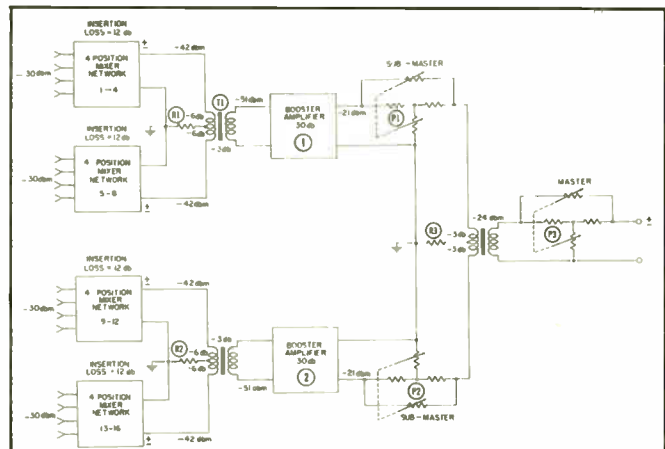


Fig. 20. A 16-position hybrid-coil mixer network.

A more elaborate mixer network and its associated equipment is shown in Fig 19. This network is termed a "split-mixer"; that is, it may be divided into two separate sections by means of a key switch (S1), or combined into a 10-position mixer. The ten positions are shown split into two groups of five positions each. Building-out resistors (R7 and R8) and submaster controls (P5 and P6) for adjusting the overall level of each group are located at the output of each group. Output transformers T3 and T4 may be used to feed a single or two separate recording channels. Such mixers are often used for recording where a vocal group and a large orchestra are located on separate stages during the recording session.

The controls may be of any configuration, provided they are unbalanced and therefore satisfy the impedance requirements. The common side of each mixer control is brought to a common ground point, using individual ground wires which are

shielded and covered with a protective plastic or cloth braid to prevent ground loops.

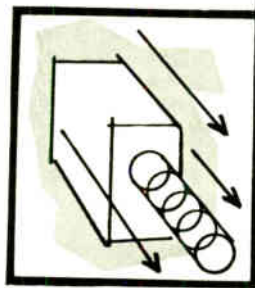
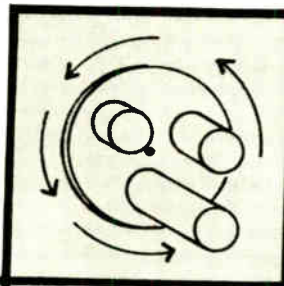
The unbalanced configuration may be changed to a balanced one by connecting half of each resistor in each side of the network as explained for other balanced networks. Of course, the mixer controls must also be changed to balanced configurations. Combining networks have a fixed loss caused by the resistance of the building-out resistors ( $R_{11}$ ). Increasing the number of mixer positions increases the insertion loss of the network.

To simplify the design procedure of a mixer network, the values of the building-out resistors for networks of 150, 200, 500, and 600 ohms are tabulated in Table 4. For mixer networks of 12 positions or more it is recommended that the controls be separated into groups of four and then combined by means of hybrid coils, as shown in Fig. 20. (The loss and amplifier gains shown in Fig. 20 are for a typical mixer.)

Table 4. Values of Building-Out Resistors and Insertion Loss for Parallel Sound-Mixer Networks

| Mixer Positions | Impedance 150Ω |                   |       | Impedance 200Ω |                   |       | Impedance 250Ω |                   |       | Impedance 500Ω |                   |       | Impedance 600Ω |                   |       |
|-----------------|----------------|-------------------|-------|----------------|-------------------|-------|----------------|-------------------|-------|----------------|-------------------|-------|----------------|-------------------|-------|
|                 | $R_{11}$ Ohms  | Insertion Loss—dB |       | $R_{11}$ Ohms  | Insertion Loss—dB |       | $R_{11}$ Ohms  | Insertion Loss—dB |       | $R_{11}$ Ohms  | Insertion Loss—dB |       | $R_{11}$ Ohms  | Insertion Loss—dB |       |
|                 |                | BT, T             | Lad.  |                | BT, T             | Lad.  |                | BT, T             | Lad.  |                | BT, T             | Lad.  |                | BT, T             | Lad.  |
| 2               | 50.0           | 6.00              | 12.00 | 66.6           | 6.00              | 12.00 | 83.3           | 6.00              | 12.00 | 166.0          | 6.00              | 12.00 | 200.0          | 6.00              | 12.00 |
| 3               | 75.0           | 9.50              | 15.50 | 125.0          | 9.50              | 15.50 | 100.0          | 9.50              | 15.50 | 250.0          | 9.50              | 15.50 | 300.0          | 9.50              | 15.50 |
| 4               | 90.0           | 12.00             | 18.00 | 120.0          | 12.00             | 18.00 | 150.0          | 12.00             | 18.00 | 300.0          | 12.00             | 18.00 | 360.0          | 12.00             | 18.00 |
| 5               | 100.0          | 14.00             | 20.00 | 133.0          | 14.00             | 20.00 | 166.0          | 14.00             | 20.00 | 333.0          | 14.00             | 20.00 | 400.0          | 14.00             | 20.00 |
| 6               | 107.0          | 15.60             | 21.60 | 142.8          | 15.60             | 21.60 | 178.5          | 15.60             | 21.60 | 357.0          | 15.60             | 21.60 | 428.4          | 15.60             | 21.60 |
| 7               | 112.5          | 16.90             | 22.90 | 150.0          | 16.90             | 22.90 | 187.5          | 16.90             | 22.90 | 375.0          | 16.90             | 22.90 | 450.0          | 16.90             | 22.90 |
| 8               | 116.6          | 18.10             | 24.10 | 155.5          | 18.10             | 24.10 | 194.0          | 18.10             | 24.10 | 388.0          | 18.10             | 24.10 | 466.0          | 18.10             | 24.10 |
| 9               | 120.0          | 19.08             | 25.08 | 160.0          | 19.08             | 25.08 | 200.0          | 19.08             | 25.08 | 400.0          | 19.08             | 25.08 | 480.0          | 19.08             | 25.08 |
| 10              | 123.0          | 20.00             | 26.00 | 163.8          | 20.00             | 26.00 | 202.2          | 20.00             | 26.00 | 409.0          | 20.00             | 26.00 | 491.0          | 20.00             | 26.00 |
| 11              | 124.9          | 20.82             | 26.82 | 166.5          | 20.82             | 26.82 | 208.0          | 20.82             | 26.82 | 416.0          | 20.82             | 26.82 | 499.0          | 20.82             | 26.82 |
| 12              | 127.0          | 21.58             | 27.58 | 169.1          | 21.58             | 27.58 | 210.8          | 21.58             | 27.58 | 422.5          | 21.58             | 27.58 | 507.0          | 21.58             | 27.58 |

From the discontent of man...



the world's best progress springs

Ella Wheeler Wilcox

Challenged by the limitations imposed by the cumbersome device of the turret, Zoomar has given the camera a new dimension—an exciting lifelike versatility approaching that of the human eye—a tool that dramatically helps to translate into being the skill and imagination of the engineer and operator. Zoomar, pioneer in the development of the zoom lens, continues its program of further progress and perfection.

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### DECIBEL TABLE

Courtesy Jampro Antenna Company

GIVEN: Decibels

TO FIND: Power and  $\left\{ \begin{matrix} \text{Voltage} \\ \text{Current} \end{matrix} \right\}$  Ratios

TO ACCOUNT FOR THE SIGN OF THE DECIBEL

For negative (-) values of the decibel—Both voltage and power ratios are less than unity. Use the two left-hand columns.

For positive (+) values of the decibel—Both voltage and power ratios are greater than unity. Use the two right-hand columns.

| ← -dB + →     |             |     |               |             | ← -dB + →     |             |      |               |             |
|---------------|-------------|-----|---------------|-------------|---------------|-------------|------|---------------|-------------|
| Voltage Ratio | Power Ratio | dB  | Voltage Ratio | Power Ratio | Voltage Ratio | Power Ratio | dB   | Voltage Ratio | Power Ratio |
| .9886         | .9772       | .1  | 1.012         | 1.023       | .4732         | .2239       | 6.5  | 2.113         | 4.467       |
| .9772         | .9550       | .2  | 1.028         | 1.047       | .4677         | .2188       | 6.6  | 2.138         | 4.571       |
| .9661         | .9333       | .3  | 1.035         | 1.072       | .4624         | .2138       | 6.7  | 2.163         | 4.677       |
| .9550         | .9120       | .4  | 1.047         | 1.096       | .4571         | .2089       | 6.8  | 2.188         | 4.786       |
| .9441         | .8913       | .5  | 1.059         | 1.122       | .4519         | .2042       | 6.9  | 2.213         | 4.898       |
| .9333         | .8710       | .6  | 1.072         | 1.148       | .4467         | .1995       | 7.0  | 2.239         | 5.012       |
| .9226         | .8511       | .7  | 1.084         | 1.175       | .4416         | .1950       | 7.1  | 2.265         | 5.129       |
| .9120         | .8318       | .8  | 1.096         | 1.202       | .4365         | .1905       | 7.2  | 2.291         | 5.248       |
| .9016         | .8128       | .9  | 1.109         | 1.230       | .4315         | .1862       | 7.3  | 2.317         | 5.370       |
| .8913         | .7943       | 1.0 | 1.122         | 1.259       | .4266         | .1820       | 7.4  | 2.344         | 5.495       |
| .8810         | .7762       | 1.1 | 1.135         | 1.288       | .4217         | .1778       | 7.5  | 2.371         | 5.623       |
| .8710         | .7586       | 1.2 | 1.148         | 1.318       | .4169         | .1738       | 7.6  | 2.399         | 5.754       |
| .8610         | .7413       | 1.3 | 1.161         | 1.349       | .4121         | .1698       | 7.7  | 2.427         | 5.888       |
| .8511         | .7244       | 1.4 | 1.175         | 1.380       | .4074         | .1660       | 7.8  | 2.455         | 6.026       |
| .8414         | .7079       | 1.5 | 1.189         | 1.413       | .4027         | .1622       | 7.9  | 2.483         | 6.166       |
| .8318         | .6918       | 1.6 | 1.202         | 1.445       | .3981         | .1585       | 8.0  | 2.512         | 6.310       |
| .8222         | .6761       | 1.7 | 1.216         | 1.479       | .3936         | .1549       | 8.1  | 2.541         | 6.457       |
| .8128         | .6607       | 1.8 | 1.230         | 1.514       | .3890         | .1514       | 8.2  | 2.570         | 6.607       |
| .8035         | .6457       | 1.9 | 1.245         | 1.549       | .3846         | .1479       | 8.3  | 2.600         | 6.761       |
| .7943         | .6310       | 2.0 | 1.239         | 1.585       | .3802         | .1445       | 8.4  | 2.630         | 6.918       |
| .7852         | .6166       | 2.1 | 1.274         | 1.622       | .3758         | .1413       | 8.5  | 2.661         | 7.079       |
| .7762         | .6026       | 2.2 | 1.288         | 1.660       | .3715         | .1380       | 8.6  | 2.692         | 7.244       |
| .7674         | .5888       | 2.3 | 1.303         | 1.698       | .3673         | .1349       | 8.7  | 2.723         | 7.413       |
| .7586         | .5754       | 2.4 | 1.318         | 1.738       | .3631         | .1318       | 8.8  | 2.754         | 7.586       |
| .7499         | .5623       | 2.5 | 1.334         | 1.778       | .3589         | .1288       | 8.9  | 2.786         | 7.762       |
| .7413         | .5495       | 2.6 | 1.349         | 1.820       | .3548         | .1259       | 9.0  | 2.818         | 7.943       |
| .7328         | .5370       | 2.7 | 1.365         | 1.862       | .3508         | .1230       | 9.1  | 2.851         | 8.128       |
| .7244         | .5248       | 2.8 | 1.380         | 1.905       | .3467         | .1202       | 9.2  | 2.884         | 8.318       |
| .7161         | .5129       | 2.9 | 1.396         | 1.950       | .3428         | .1175       | 9.3  | 2.917         | 8.511       |
| .7079         | .5012       | 3.0 | 1.413         | 1.995       | .3388         | .1148       | 9.4  | 2.951         | 8.710       |
| .6998         | .4898       | 3.1 | 1.429         | 2.042       | .3350         | .1122       | 9.5  | 2.985         | 8.913       |
| .6918         | .4786       | 3.2 | 1.445         | 2.089       | .3311         | .1096       | 9.6  | 3.020         | 9.120       |
| .6839         | .4677       | 3.3 | 1.462         | 2.138       | .3273         | .1072       | 9.7  | 3.055         | 9.333       |
| .6761         | .4571       | 3.4 | 1.479         | 2.188       | .3236         | .1047       | 9.8  | 3.090         | 9.550       |
| .6683         | .4467       | 3.5 | 1.496         | 2.239       | .3199         | .1023       | 9.9  | 3.126         | 9.772       |
| .6607         | .4365       | 3.6 | 1.514         | 2.291       | .3162         | .1000       | 10.0 | 3.162         | 10.000      |
| .6531         | .4266       | 3.7 | 1.531         | 2.344       | .3126         | .09772      | 10.1 | 3.190         | 10.23       |
| .6457         | .4169       | 3.8 | 1.549         | 2.399       | .3090         | .09550      | 10.2 | 3.236         | 10.47       |
| .6383         | .4074       | 3.9 | 1.567         | 2.455       | .3055         | .09333      | 10.3 | 3.273         | 10.72       |
| .6310         | .3981       | 4.0 | 1.585         | 2.512       | .3020         | .09120      | 10.4 | 3.311         | 10.96       |
| .6237         | .3890       | 4.1 | 1.603         | 2.570       | .2985         | .08913      | 10.5 | 3.350         | 11.22       |
| .6166         | .3802       | 4.2 | 1.622         | 2.630       | .2951         | .08710      | 10.6 | 3.388         | 11.48       |
| .6095         | .3715       | 4.3 | 1.641         | 2.692       | .2917         | .08511      | 10.7 | 3.428         | 11.75       |
| .6026         | .3631       | 4.4 | 1.660         | 2.754       | .2884         | .08318      | 10.8 | 3.467         | 12.02       |
| .5957         | .3548       | 4.5 | 1.679         | 2.818       | .2851         | .08128      | 10.9 | 3.508         | 12.30       |
| .5888         | .3467       | 4.6 | 1.698         | 2.884       | .2818         | .07943      | 11.0 | 3.548         | 12.59       |
| .5821         | .3388       | 4.7 | 1.718         | 2.951       | .2786         | .07762      | 11.1 | 3.589         | 12.88       |
| .5754         | .3311       | 4.8 | 1.738         | 3.020       | .2754         | .07586      | 11.2 | 3.631         | 13.18       |
| .5689         | .3236       | 4.9 | 1.758         | 3.090       | .2723         | .07413      | 11.3 | 3.673         | 13.49       |
| .5623         | .3162       | 5.0 | 1.788         | 3.162       | .2692         | .07244      | 11.4 | 3.715         | 13.80       |
| .5559         | .3090       | 5.1 | 1.799         | 3.236       | .2661         | .07079      | 11.5 | 3.758         | 14.13       |
| .5495         | .3020       | 5.2 | 1.820         | 3.311       | .2630         | .06918      | 11.6 | 3.802         | 14.45       |
| .5433         | .2951       | 5.3 | 1.841         | 3.388       | .2600         | .06761      | 11.7 | 3.846         | 14.79       |
| .5370         | .2884       | 5.4 | 1.862         | 3.467       | .2570         | .06607      | 11.8 | 3.890         | 15.14       |
| .5309         | .2818       | 5.5 | 1.884         | 3.548       | .2541         | .06457      | 11.9 | 3.936         | 15.49       |
| .5248         | .2754       | 5.6 | 1.905         | 3.631       | .2512         | .06310      | 12.0 | 3.981         | 15.85       |
| .5188         | .2692       | 5.7 | 1.928         | 3.715       | .2483         | .06166      | 12.1 | 4.027         | 16.22       |
| .5129         | .2630       | 5.8 | 1.950         | 3.802       | .2455         | .06026      | 12.2 | 4.074         | 16.60       |
| .5070         | .2570       | 5.9 | 1.972         | 3.890       | .2427         | .05888      | 12.3 | 4.121         | 16.98       |
| .5012         | .2512       | 6.0 | 1.995         | 3.981       | .2399         | .05754      | 12.4 | 4.169         | 17.38       |
| .4955         | .2455       | 6.1 | 2.018         | 4.074       | .2371         | .05623      | 12.5 | 4.217         | 17.78       |
| .4898         | .2399       | 6.2 | 2.042         | 4.169       | .2344         | .05495      | 12.6 | 4.266         | 18.20       |
| .4842         | .2344       | 6.3 | 2.065         | 4.266       | .2317         | .05370      | 12.7 | 4.315         | 18.62       |
| .4786         | .2291       | 6.4 | 2.089         | 4.365       | .2291         | .05248      | 12.8 | 4.365         | 19.05       |

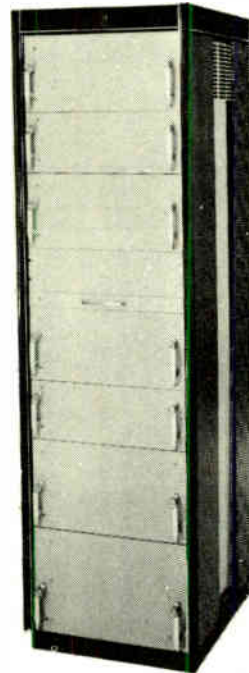


## Engineering Data

| ← -dB+ →      |             |      |               |             |
|---------------|-------------|------|---------------|-------------|
| Voltage Ratio | Power Ratio | dB   | Voltage Ratio | Power Ratio |
| .2265         | .05129      | 12.9 | 4.416         | 19.50       |
| .2239         | .05012      | 13.0 | 4.467         | 19.95       |
| .2213         | .04898      | 13.1 | 4.519         | 20.42       |
| .2188         | .04786      | 13.2 | 4.571         | 20.89       |
| .2163         | .04677      | 13.3 | 4.624         | 21.38       |
| .2138         | .04571      | 13.4 | 4.677         | 21.88       |
| .2113         | .04467      | 13.5 | 4.732         | 22.39       |
| .2089         | .04365      | 13.6 | 4.786         | 22.91       |
| .2065         | .04266      | 13.7 | 4.842         | 23.44       |
| .2042         | .04169      | 13.8 | 4.898         | 23.99       |
| .2018         | .04074      | 13.9 | 4.955         | 24.55       |
| .1995         | .03981      | 14.0 | 5.012         | 25.12       |
| .1972         | .03890      | 14.1 | 5.070         | 25.70       |
| .1950         | .03802      | 14.2 | 5.129         | 26.30       |
| .1928         | .03715      | 14.3 | 5.188         | 26.92       |
| .1905         | .03631      | 14.4 | 5.248         | 27.54       |
| .1884         | .03548      | 14.5 | 5.309         | 28.18       |
| .1862         | .03467      | 14.6 | 5.370         | 28.84       |
| .1841         | .03388      | 14.7 | 5.433         | 29.51       |
| .1820         | .03311      | 14.8 | 5.495         | 30.20       |
| .1799         | .03236      | 14.9 | 5.559         | 30.90       |
| .1778         | .03162      | 15.0 | 5.623         | 31.62       |
| .1758         | .03090      | 15.1 | 5.689         | 32.36       |
| .1738         | .03020      | 15.2 | 5.754         | 33.11       |
| .1718         | .02951      | 15.3 | 5.821         | 33.88       |
| .1698         | .02884      | 15.4 | 5.888         | 34.67       |
| .1679         | .02818      | 15.5 | 5.957         | 35.48       |
| .1660         | .02754      | 15.6 | 6.026         | 36.31       |
| .1641         | .02692      | 15.7 | 6.095         | 37.15       |
| .1622         | .02630      | 15.8 | 6.166         | 38.02       |
| .1603         | .02570      | 15.9 | 6.237         | 38.90       |
| .1585         | .02512      | 16.0 | 6.310         | 39.81       |
| .1567         | .02455      | 16.1 | 6.383         | 40.74       |
| .1549         | .02399      | 16.2 | 6.457         | 41.69       |
| .1531         | .02344      | 16.3 | 6.531         | 42.66       |
| .1514         | .02291      | 16.4 | 6.607         | 43.65       |

| ← -dB+ → |        |      |        |        |
|----------|--------|------|--------|--------|
| .1496    | .02239 | 16.5 | 6.683  | 44.67  |
| .1479    | .02188 | 16.6 | 6.761  | 45.71  |
| .1462    | .02138 | 16.7 | 6.839  | 46.77  |
| .1445    | .02089 | 16.8 | 6.918  | 47.86  |
| .1429    | .02042 | 16.9 | 6.998  | 48.98  |
| .1413    | .01995 | 17.0 | 7.079  | 50.12  |
| .1396    | .01950 | 17.1 | 7.161  | 51.29  |
| .1380    | .01905 | 17.2 | 7.244  | 52.48  |
| .1365    | .01862 | 17.3 | 7.328  | 53.70  |
| .1349    | .01820 | 17.4 | 7.413  | 54.95  |
| .1334    | .01778 | 17.5 | 7.499  | 56.23  |
| .1318    | .01738 | 17.6 | 7.586  | 57.54  |
| .1303    | .01698 | 17.7 | 7.674  | 58.88  |
| .1288    | .01660 | 17.8 | 7.762  | 60.26  |
| .1274    | .01622 | 17.9 | 7.852  | 61.66  |
| .1259    | .01585 | 18.0 | 7.943  | 63.10  |
| .1245    | .01549 | 18.1 | 8.035  | 64.57  |
| .1230    | .01514 | 18.2 | 8.128  | 66.07  |
| .1216    | .01479 | 18.3 | 8.233  | 67.61  |
| .1202    | .01445 | 18.4 | 8.318  | 69.18  |
| .1189    | .01413 | 18.5 | 8.414  | 70.79  |
| .1175    | .01380 | 18.6 | 8.511  | 72.44  |
| .1161    | .01349 | 18.7 | 8.610  | 74.13  |
| .1148    | .01318 | 18.8 | 8.710  | 75.86  |
| .1135    | .01288 | 18.9 | 8.811  | 77.62  |
| .1122    | .01269 | 19.0 | 8.913  | 79.43  |
| .1109    | .01230 | 19.1 | 9.016  | 81.28  |
| .1096    | .01202 | 19.2 | 9.120  | 83.18  |
| .1084    | .01175 | 19.3 | 9.226  | 85.11  |
| .1072    | .01148 | 19.4 | 9.333  | 87.10  |
| .1059    | .01122 | 19.5 | 9.441  | 89.13  |
| .1047    | .01096 | 19.6 | 9.550  | 91.20  |
| .1035    | .01072 | 19.7 | 9.661  | 93.33  |
| .1023    | .01047 | 19.8 | 9.772  | 95.50  |
| .1012    | .01023 | 19.9 | 9.886  | 97.72  |
| .1000    | .01000 | 20.0 | 10.000 | 100.00 |

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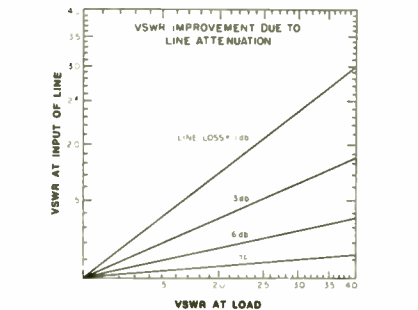
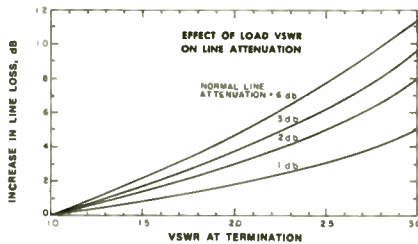
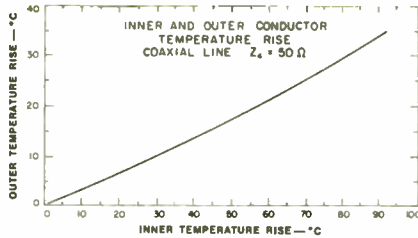
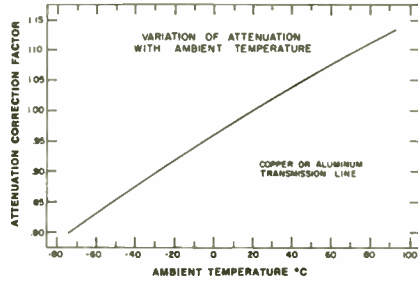
# COAXIAL CABLE DATA

Courtesy Andrew Corporation

## Coaxial Transmission Line Attenuation and Power Rating

### Attenuation

The following pages show the attenuation versus frequency characteristics of all standard Andrew rigid and HELIAX transmission lines. The values shown are for 24°C (75°F) ambient, and increase slightly with higher temperature or applied power, up to approximately 13% above the curves at full average power rating. The curve at left shows this relationship. Inner and outer conductor temperature rise is also shown for reference.



### Effect of VSWR on Attenuation

When transmission line is attached to an antenna, the VSWR of the antenna increases the attenuation of the line. This effect is quite small for normal conditions. The curve shows increase in line loss versus VSWR.

### Effect of Attenuation on VSWR

Antenna VSWR, as measured at the input to the connecting transmission line, is reduced by the attenuation of the line. The curves show this relationship.

### Power Ratings

Peak and average power ratings are both required to describe fully the capabilities of a given transmission line. Typically, peak power ratings limit the line for low frequency or pulse usage while average power ratings limit the higher frequency usage.

### Standard Peak Power Ratings

The permissible voltage between inner and outer conductor of a coaxial cable determines the peak power rating.

Voltage breakdown is independent of frequency, but varies with line pressure and VSWR. Peak power ratings are therefore generally stated for the following conditions: Unity VSWR, no modulation, and one atmosphere absolute dry air pressure. 100% AM modulation reduces the peak power rating by a factor of 4. Peak power rating is given by the following expression.

$$P_{pk} = \frac{(E_{rt})^2}{Z_0(1+M)^2 VSWR} (S_d)^2 \text{ watts}$$

Where M is modulation percentage expressed decimally, VSWR is voltage standing wave ratio on the line,  $S_d$  is dielectric strength of the pressurizing medium relative to air,  $E_{rt}$  is determined as follows:  $E_{rt} = 0.247 E_p$ .  $E_p$  is the DC production test voltage (the values in the table below are typical), and the constant 0.247 includes factors to relate DC voltage to RF voltage, to adjust to rms value, and includes a safety factor of 2. All of these factors are empirical and have been extensively verified.

| Outer Conductor OD, inches | 1/2   | 3/4    | 1      | 1 1/4  | 1 1/2  | 2      | 3      |
|----------------------------|-------|--------|--------|--------|--------|--------|--------|
| $E_p$ volts                | 6,000 | 11,000 | 16,000 | 19,000 | 26,000 | 35,000 | 50,000 |

**INCREASED PEAK POWER RATINGS** can be obtained through pressurization or the use of high dielectric strength gases or both. Variation of peak power rating with absolute pressure and use of dry air and Sulfur Hexafluoride ( $SF_6$ ) is shown at the right. These curves are based on voltage-pressure tests conducted on transmission lines and components.

**STANDARD AVERAGE POWER RATINGS** are determined by the safe long term operating temperature of the inner conductor when the cable is operated in a 40°C (104°F) ambient. The ratings are based upon an inner conductor temperature of 100°C (212°F) for HELIAX air dielectric coaxial cable (polyethylene) and 79°C (175°F) for foam HELIAX coaxial cable. Rigid line ratings are based upon an inner conductor temperature of 101°C (216°F).

The curve at the right indicates the variation of average power rating with ambient temperature. Average power rating may be calculated from the following:

$$P_{av} = \frac{16,380 \text{ } \sigma \text{ } d}{d B_1} \text{ watts}$$

where  $P_{av}$  = average power rating for conditions described above.

D is OD of line in inches;  $d B_1$  is measured attenuation derated for increase in loss at elevated temperature; and  $\sigma$  is heat emissivity coefficient of outer conductor in watts/in.<sup>2</sup>

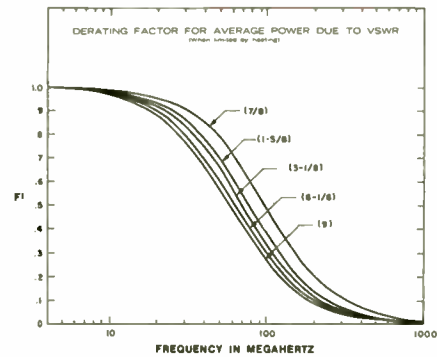
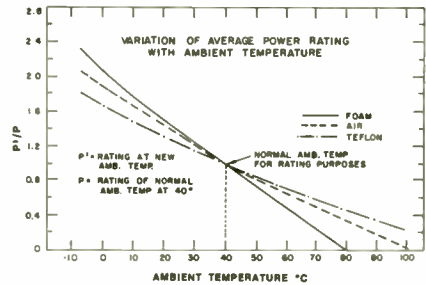
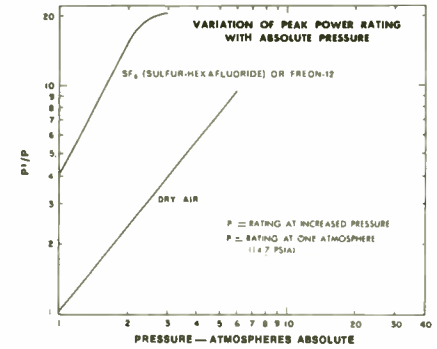
For CW, AM, or FM applications, the average power rating of a cable is determined by derating the presented power curves according to VSWR. See expression below. SSB transmitters are generally rated by peak envelope power (PEP). Average power for these applications is considerably lower, typically about half the PEP. Television transmitter ratings are based on sync peak video power. Average power output for transmission line evaluation is 83% of nominal rating.

**DERATING AVERAGE POWER FOR VSWR** is accomplished by use of the derating factor (DF) calculated from the following formula.

$$D.F. = \frac{(VSWR^2 + 1)}{(2 VSWR)} + F^1 \frac{(VSWR^2 - 1)}{(2 VSWR)}$$

where  $F^1$  is a factor that varies with frequency and line size. Select the factor from the curve at right.

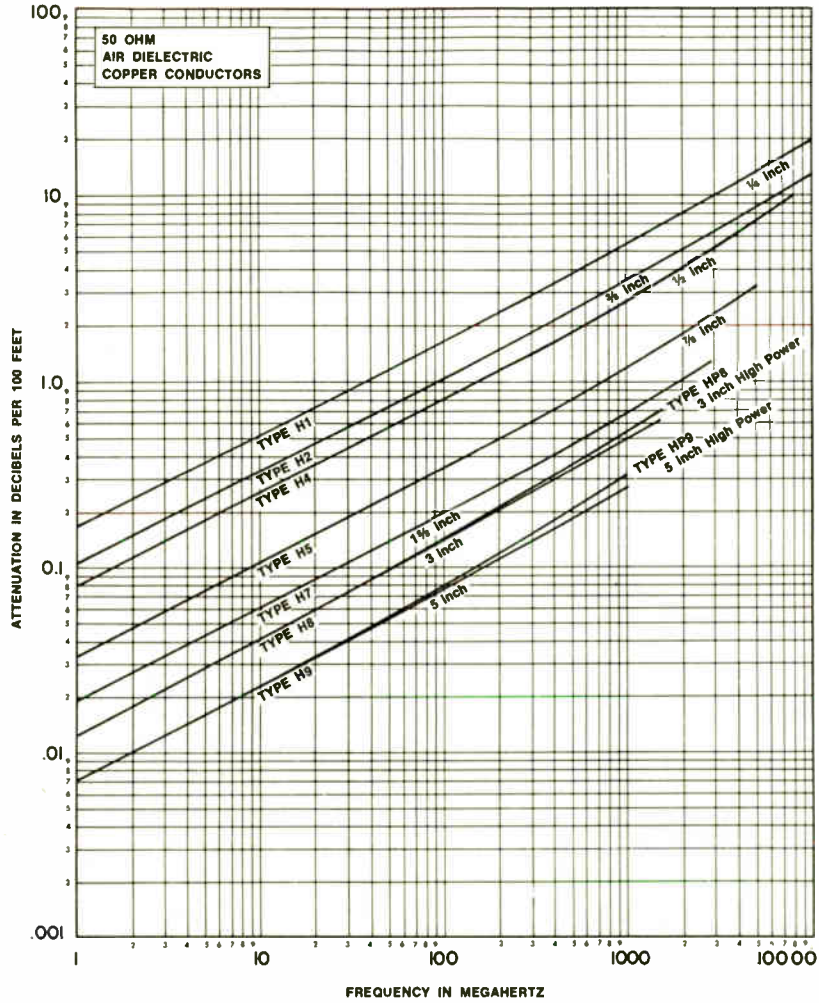
**INCREASED AVERAGE POWER RATINGS** are achievable by (1) treating the conductor surfaces for greater heat emissivity, (2) pressurizing the line, (3) using a gas with a larger heat transfer coefficient and (4) combination of these. For special applications your Andrew sales engineer will supply complete information.



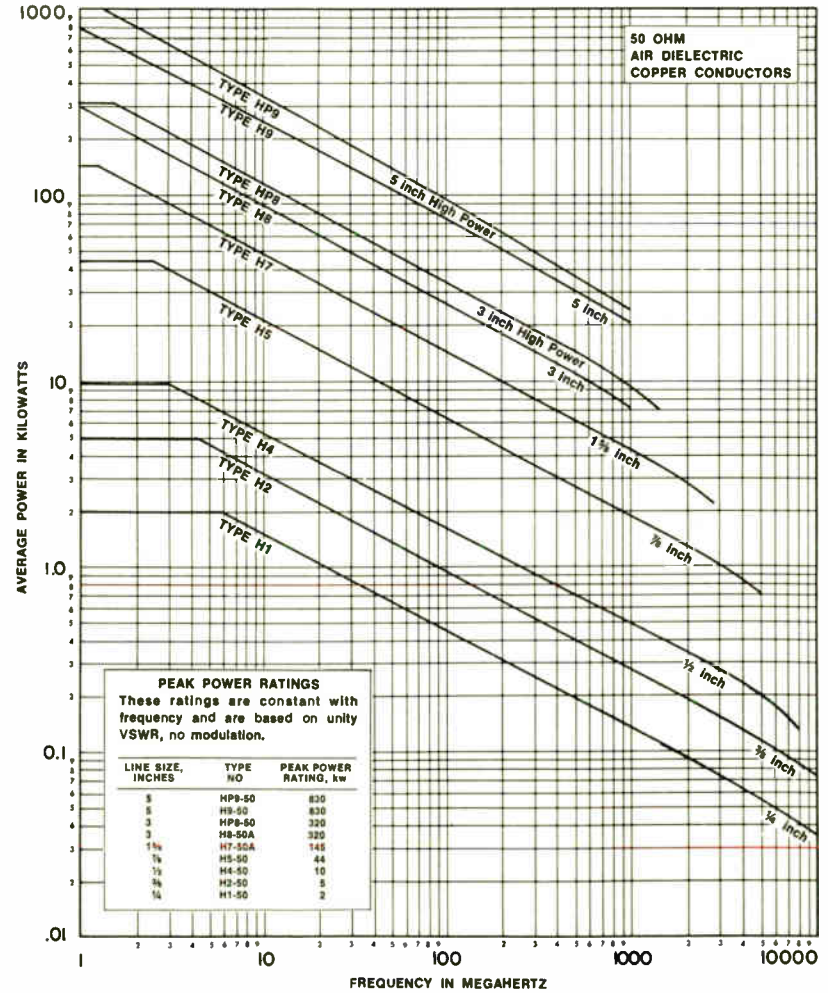
# COAXIAL CABLE DATA

Courtesy Andrew Corporation

Attenuation of Helix Coaxial Cables



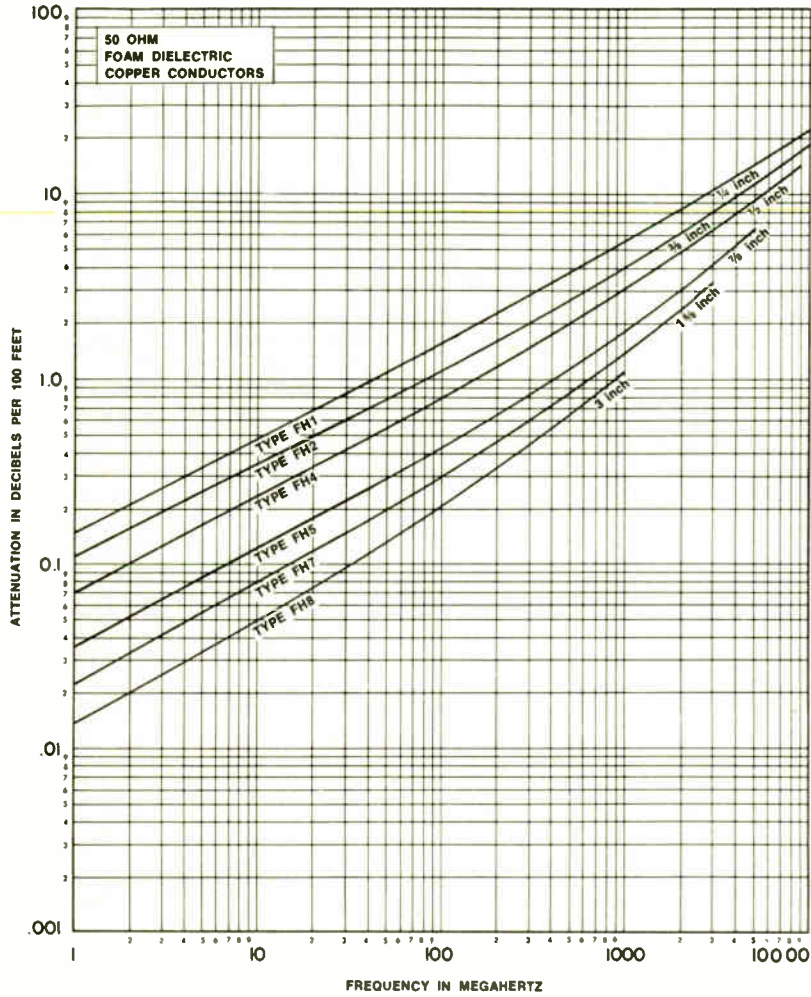
Power Rating of Helix Coaxial Cables



# COAXIAL CABLE DATA

Courtesy Andrew Corporation

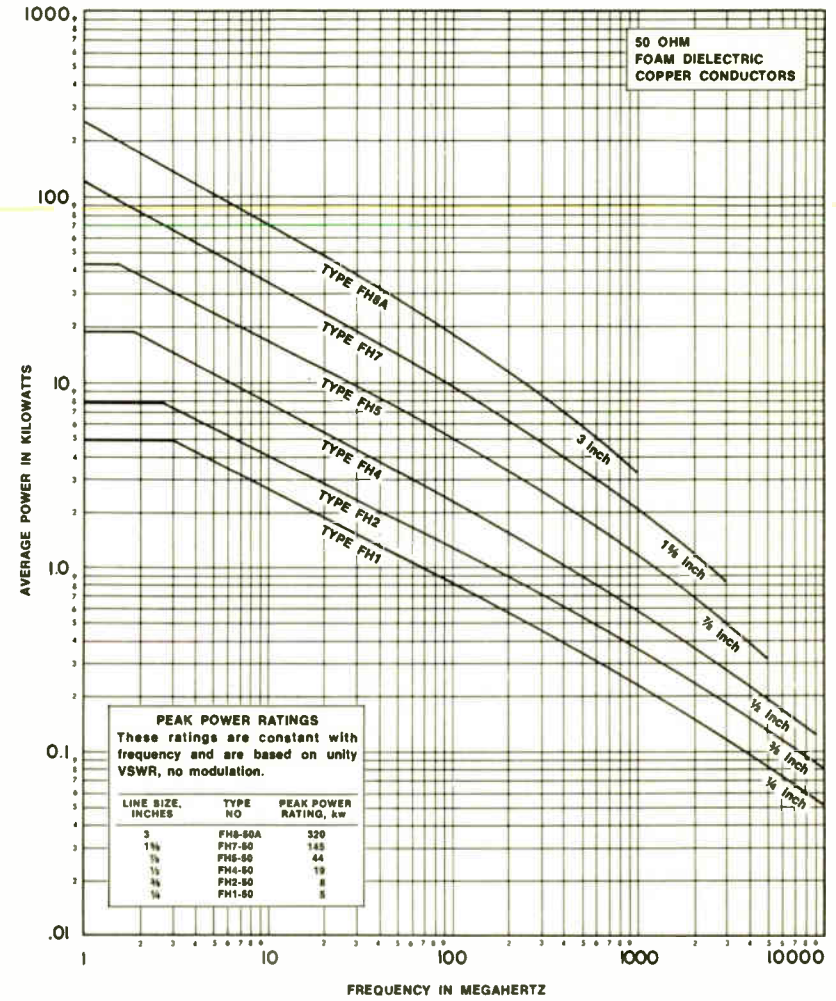
Attenuation of Heliax Coaxial Cables



Attenuation curves based on:  
VSWR 1.0:1.0  
Ambient Temperature 24° C (75° F)

Conversion Data:  
1 dB/100 feet 3.28 dB/100 meters  
For 75 ohm cables, multiply values by .95.

Power Rating of Heliax Coaxial Cables



Power Ratings based on:  
VSWR 1.0:1.0  
Ambient Temperature 40° C (104° F)  
Inner conductor temperature 79° C (175° F)

Conversion Data:  
For ambient temperature 35° C (95° F), multiply values by 1.13

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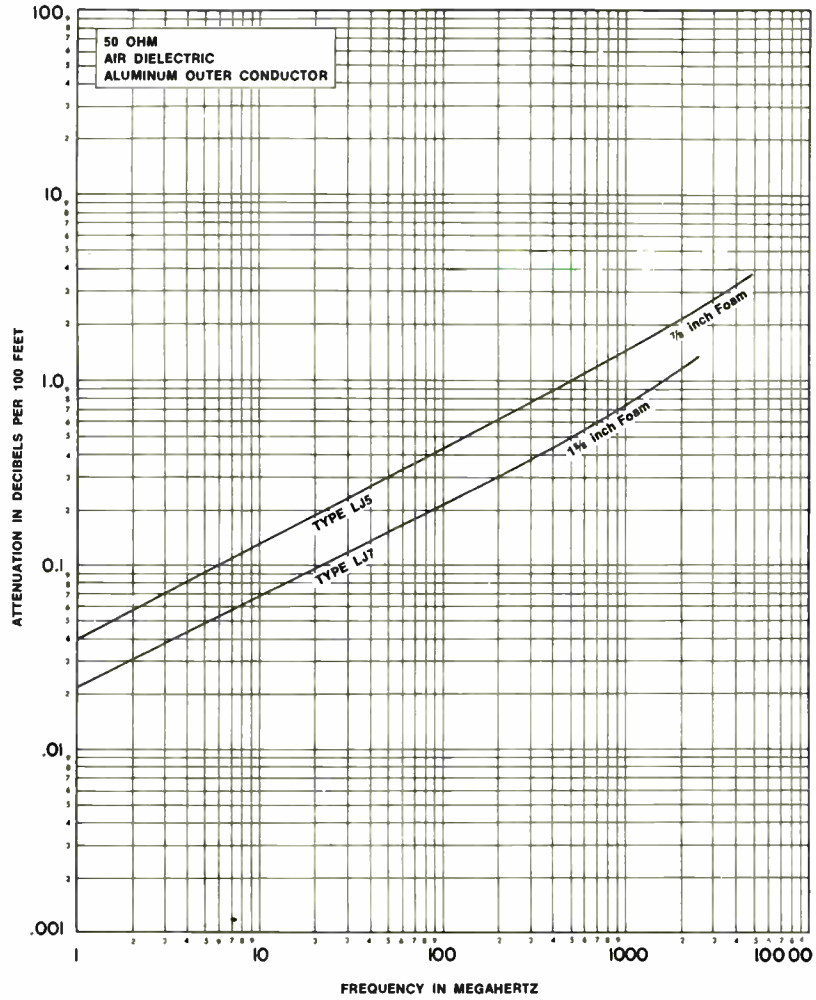
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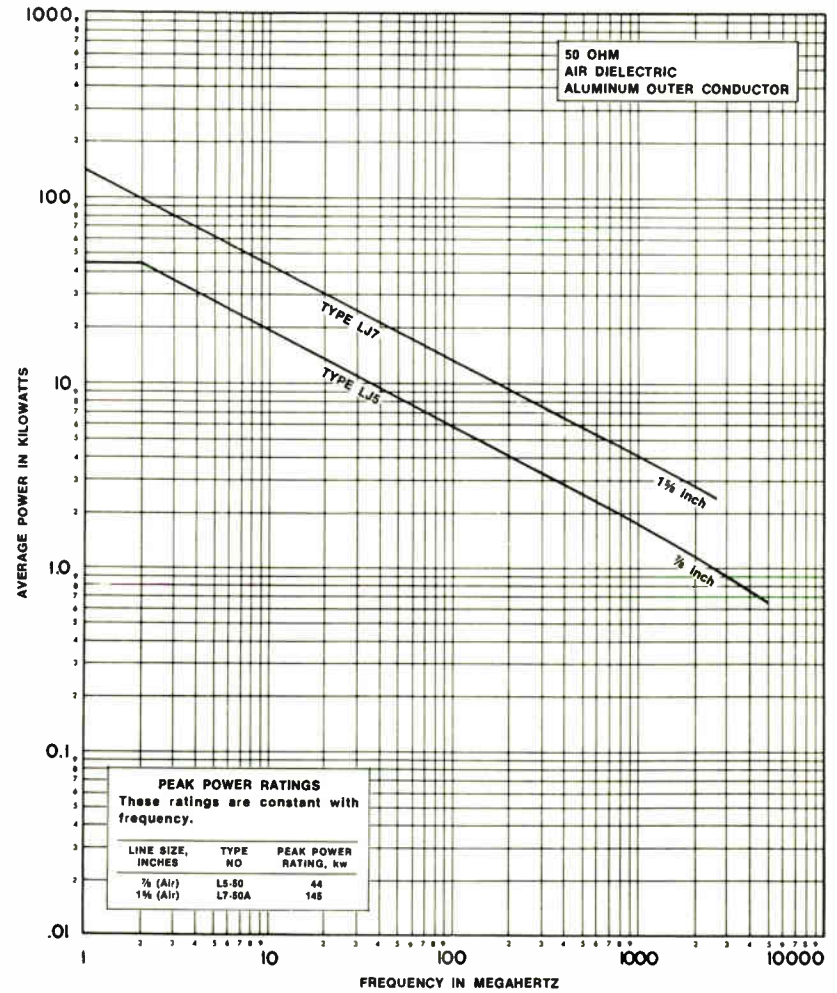
Attenuation of Heliax Coaxial Cables



Attenuation curves based on:  
VSWR 1.0:1.0  
Ambient Temperature 24°C (75 F)

Conversion Data:  
1 dB/100 feet 3.28 dB/100 meters  
For 75 ohm cables, multiply values by .95.

Power Rating of Heliax Coaxial Cables

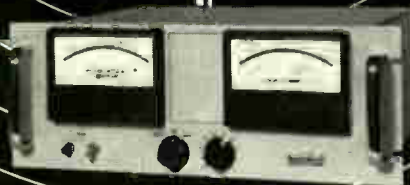


Power ratings based on:  
VSWR 1.0:1.0  
Ambient Temperature 40°C (104°F)  
Inner conductor temperature 100°C (212 F)  
One atmosphere absolute dry air pressure

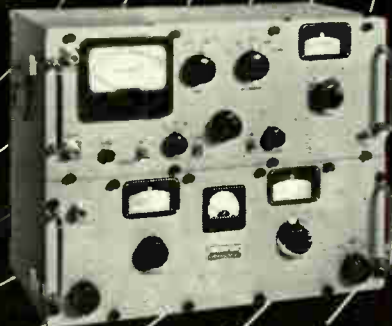
Conversion Data:  
For 75 ohm cables, multiply values by .7C.  
For ambient temperature 35°C (95 F), multiply values by 1.08

NEMS-CLARKE

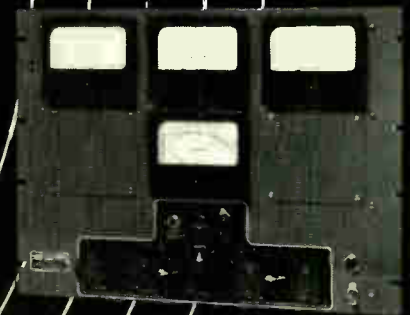
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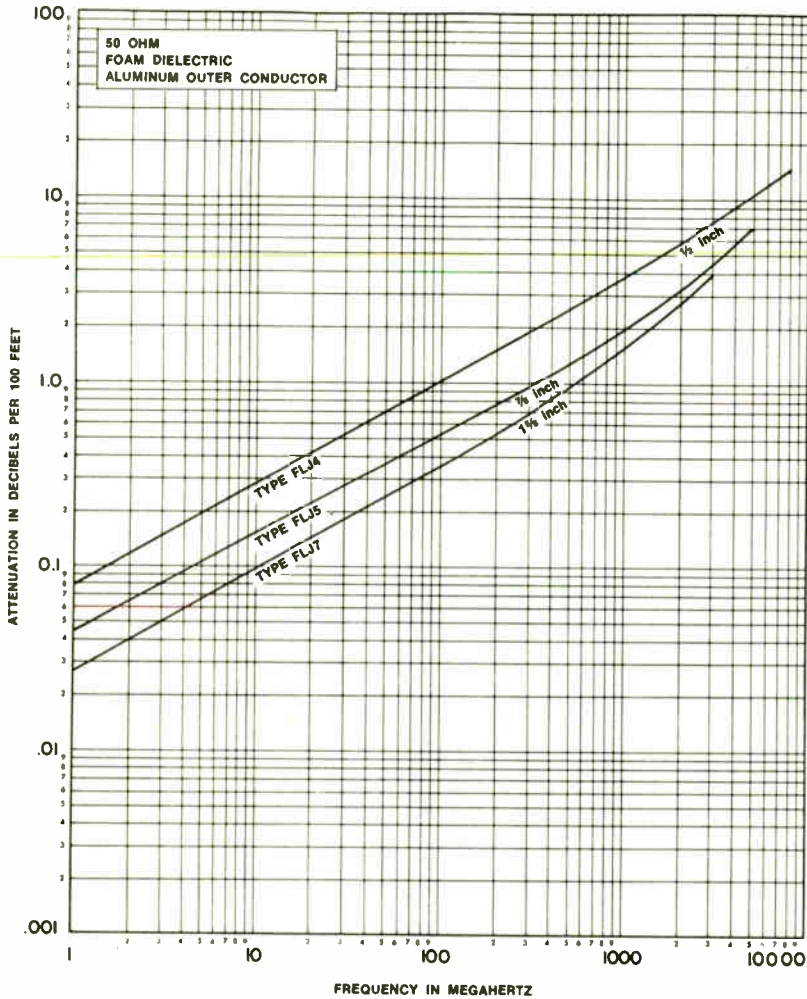
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Courtesy Andrew Corporation

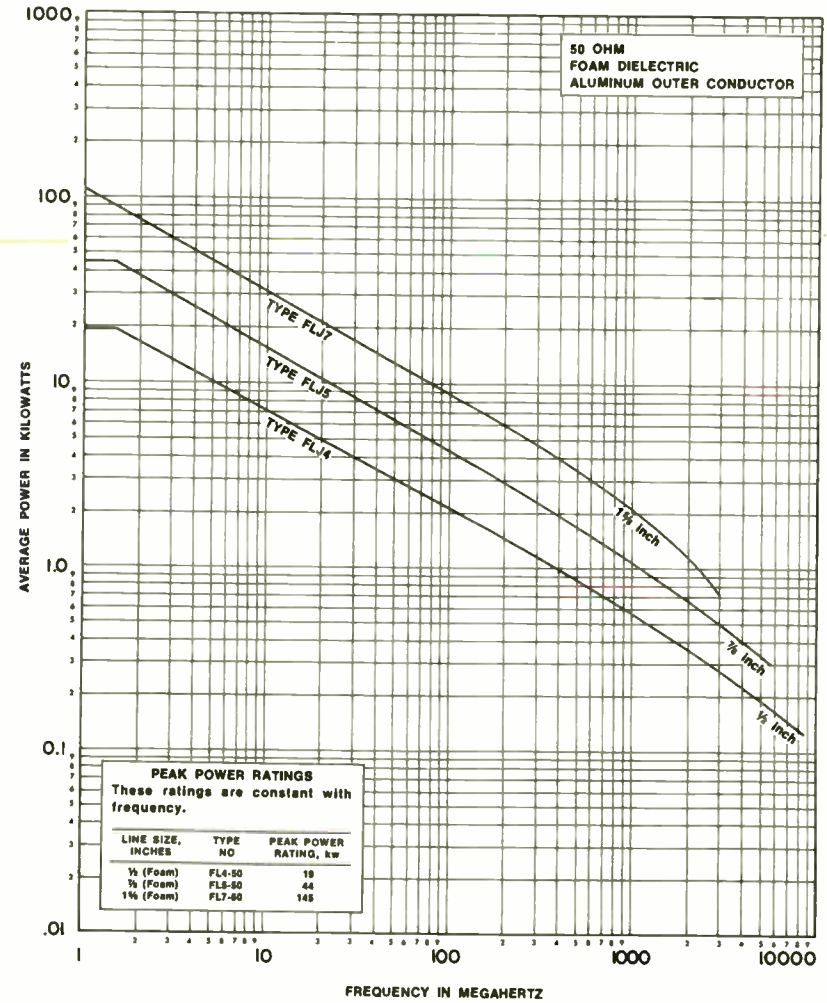
Attenuation of Heliax Coaxial Cables



Attenuation curves based on:  
VSWR 1.0:1.0  
Ambient Temperature 24°C (75°F)

Conversion Data:  
1 dB/100 feet 3.28 dB/100 meters  
For 75 ohm cables, multiply values by .95.

Power Rating of Heliax Coaxial Cables



Power ratings based on:  
VSWR 1.0:1.0  
Ambient Temperature 40°C (104°F)  
Inner conductor temperature 79°C (175 F)

Conversion Data:  
For ambient temperature 35 C (95 F), multiply values by 1.13



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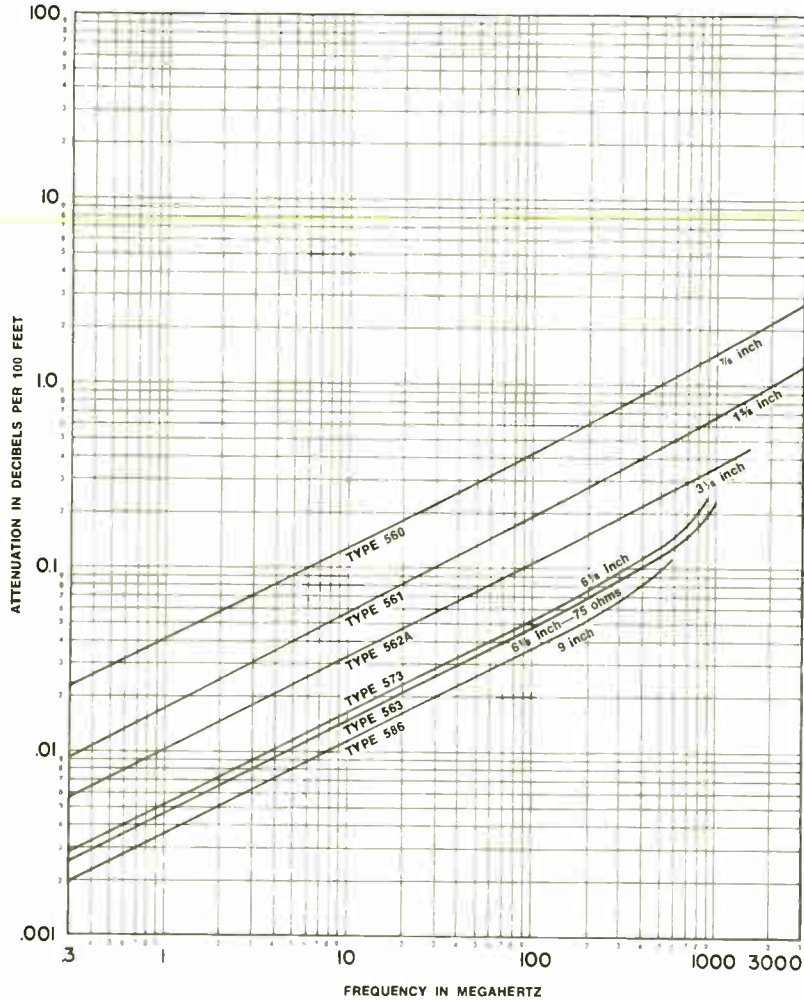


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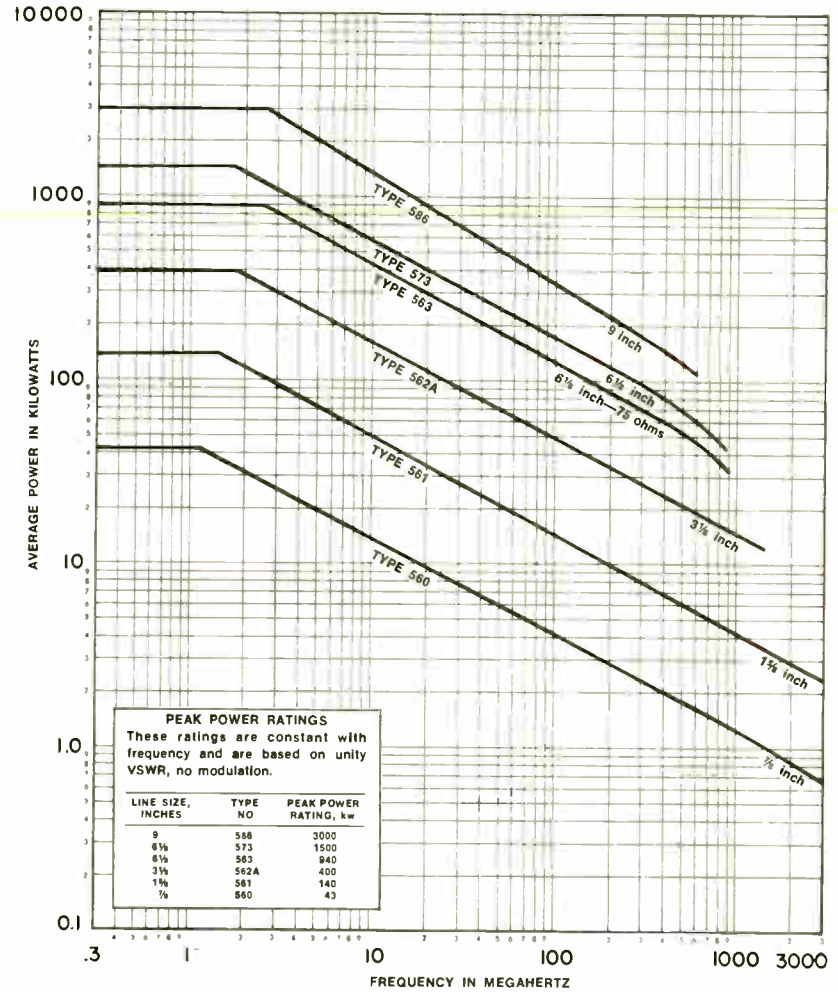
Attenuation of Rigid Transmission Lines



Attenuation curves based on:  
VSWR 1.0:1.0  
Ambient Temperature 24°C (75 F)

Conversion Data:  
1 dB/100 feet = 3.28 dB/100 meters  
Ambient Temperature 35 C (95 F)

Power Rating of Rigid Transmission Lines



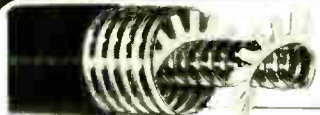
**PEAK POWER RATINGS**  
These ratings are constant with frequency and are based on unity VSWR, no modulation.

| LINE SIZE, INCHES | TYPE NO | PEAK POWER RATING, kw |
|-------------------|---------|-----------------------|
| 9                 | 586     | 3000                  |
| 6 1/2             | 573     | 1500                  |
| 6 1/2             | 563     | 940                   |
| 3 1/2             | 562A    | 400                   |
| 1 1/2             | 561     | 140                   |
| 7/8               | 560     | 45                    |

Power ratings based on:  
VSWR 1.0:1.0  
Ambient Temperature 40°C (104 F)  
Inner conductor temperature 102°C (216 F)  
One atmosphere absolute dry air pressure

Conversion Data:  
For ambient temperature 35 C (95 F), multiply values by 1.08

# TRANSMISSION LINES



## HELIAX® FLEXIBLE COAXIAL CABLES



| AIR DIELECTRIC—50 ohms |     |      |      |      |       |      |       | FOAM DIELECTRIC—50 ohms |      |      |      |      |       |      |
|------------------------|-----|------|------|------|-------|------|-------|-------------------------|------|------|------|------|-------|------|
| Size, in.              | ¼   | ⅜    | ½    | ⅞    | 1 1/8 | 3    | 5     | Size, in.               | ¼    | ⅜    | ½    | ⅞    | 1 1/8 | 3    |
| Type No.               | H1  | H2   | H4   | H5   | H7    | H8   | H9    | Type No.                | FH1  | FH2  | FH4  | FH5  | FH7   | FH8  |
| Type No. Jacketed      | HJ1 | HJ2  | HJ4  | HJ5  | HJ7   | HJ8  | HJ9   | Type No. Jacketed       | FHJ1 | FHJ2 | FHJ4 | FHJ5 | FHJ7  | FHJ8 |
| Max. Freq. GHz         | 23  | 15.5 | 10.9 | 5.2  | 2.63  | 1.64 | 960Mc | Max. Freq. GHz          | 20   | 12   | 8.1  | 4.4  | 2.3   | 1.5  |
| Peak Power Rating, kw  | 2   | 5    | 9.8  | 44   | 145   | 320  | 830   | Peak Power Rating, kw   | 5    | 8    | 19   | 44   | 145   | 320  |
| Velocity, %            | 85  | 85   | 91.4 | 91.6 | 92.1  | 93.3 | 93.0  | Velocity, %             | 79   | 79   | 79   | 79   | 79    | 92   |
| Bending Radius, in.    | 2.5 | 3.7  | 5    | 10   | 20    | 30   | 50    | Bending Radius, in.     | 2.5  | 3.7  | 5    | 10   | 20    | 50   |
| Net Wt. lbs./ft.       | .07 | .14  | .20  | .43  | .72   | 1.2  | 3     | Net Wt. lbs./ft.        | .06  | .12  | .19  | .36  | 1.06  | 3    |



## CONNECTORS



| AIR DIELECTRIC—50 ohms |     |     |     |      |       |     |     | FOAM DIELECTRIC—50 ohms |     |     |      |      |       |     |
|------------------------|-----|-----|-----|------|-------|-----|-----|-------------------------|-----|-----|------|------|-------|-----|
| Size, in.              | ¼   | ⅜   | ½   | ⅞    | 1 1/8 | 3   | 5   | Size, in.               | ¼   | ⅜   | ½    | ⅞    | 1 1/8 | 3   |
| EIA Flange             | —   | —   | —   | 75AR | 87R   | 78R | 79R | EIA Flange              | —   | —   | 44AR | 45AR | 47R   | 48R |
| "N" Jack               | 71N | 72N | 74N | 75AN | 87N   | —   | —   | "N" Jack                | 41N | 42N | 44AN | 45AN | 47N   | —   |
| "N" Plug               | 71W | 72W | 74W | 75AW | —     | —   | —   | "N" Plug                | 41W | 42W | 44AW | 45AW | 47W   | —   |
| UHF Jack               | —   | —   | 74U | 75AU | 87U   | —   | —   | UHF Jack                | 41U | —   | 44AU | 45AU | —     | —   |
| LC Jack                | —   | —   | —   | 75AL | 87L   | 78L | —   | LC Jack                 | —   | —   | 44AL | 45AL | 47L   | —   |
| LC Plug                | —   | —   | —   | 75AM | 87M   | —   | —   | LC Plug                 | —   | —   | 44AM | 45AM | —     | —   |
| End Terminal           | 71T | —   | 74T | 75AT | 87T   | —   | —   | End Terminal            | —   | —   | 44AT | 45AT | —     | —   |
| Splice                 | 71Z | 72Z | 74Z | 75AZ | 87Z   | 78Z | 79Z | Splice                  | —   | —   | 44AZ | 45AZ | 47Z   | 48Z |
|                        |     |     |     |      |       |     |     | UHF Plug                | 41P | 42P | 44AP | 45AP | —     | —   |

## WAVEGUIDES



### HELIAX® ELLIPTICAL WAVEGUIDES

Flexible waveguide for use in microwave bands from 3.7 GHz to 13 GHz. Long lengths minimize layout and installation time. Connectors mate with MIL standard or EIA flanges.

| Type No. | Frequency GHz | Attenuation Midband db/100' |
|----------|---------------|-----------------------------|
| EW-37    | 3.7- 4.2      | .8                          |
| EW-44    | 4.4- 5.0      | 1.4                         |
| EW-56    | 5.6- 6.4      | 1.5                         |
| EW-59    | 5.9- 7.1      | 1.7                         |
| EW-71    | 7.1- 8.5      | 2.1                         |
| EW-85    | 8.5-10.0      | 2.8                         |
| EW-107   | 10.7-11.7     | 3.4                         |
| EW-122   | 12.2-13.2     | 4.3                         |

RECTANGULAR and CIRCULAR WAVEGUIDES Stocked in commonly used sizes.



## COAXIAL SWITCHES

Type 6750 (6 1/8" line), Type 6740A (3 1/8" line) and Type 6730A (1 1/8" line) permit rapid switching of pairs of transmission lines operating into the UHF frequency band. Peak power ratings are 100 KW in 1 1/8" size, 300 KW in 3 1/8" size and 1500 KW in 6 1/8" size. Control panel with indicators available for remote or manual control of Andrew switching systems.

**RIGID TRANSMISSION LINES** — Andrew offers a complete selection (1/2" to 9") of 50 ohm transmission lines and accessories. All items are fully compatible with applicable EIA standards.

| CHARACTERISTICS                |      |        |        |        |      |
|--------------------------------|------|--------|--------|--------|------|
| Size                           | 1/2" | 1 1/8" | 3 1/8" | 6 1/8" | 9"   |
| Type No.                       | 560  | 561    | 562A   | 573    | 586  |
| Max. Freq. MHz                 | 3000 | 2700   | 1600   | 750    | 440  |
| Peak Power, kw                 | 43   | 140    | 400    | 1500   | 3000 |
| Weight, pounds per 20 ft. sec. | 13   | 25     | 55     | 135    | 310  |

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Low pressure dehydrators, dry air hand pumps, regulating and distribution systems, and alarm units are also available.



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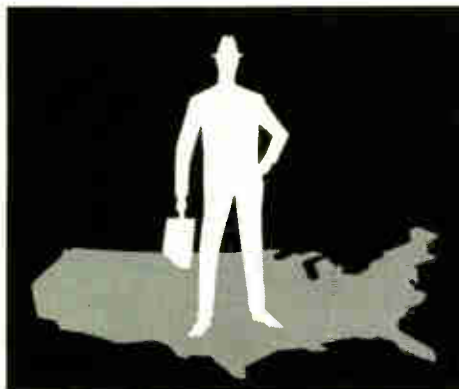
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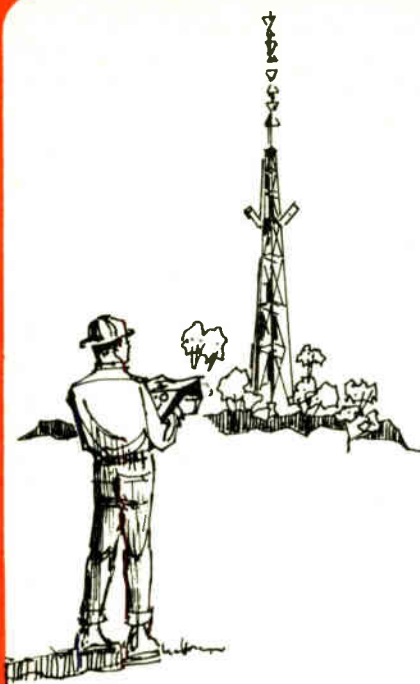


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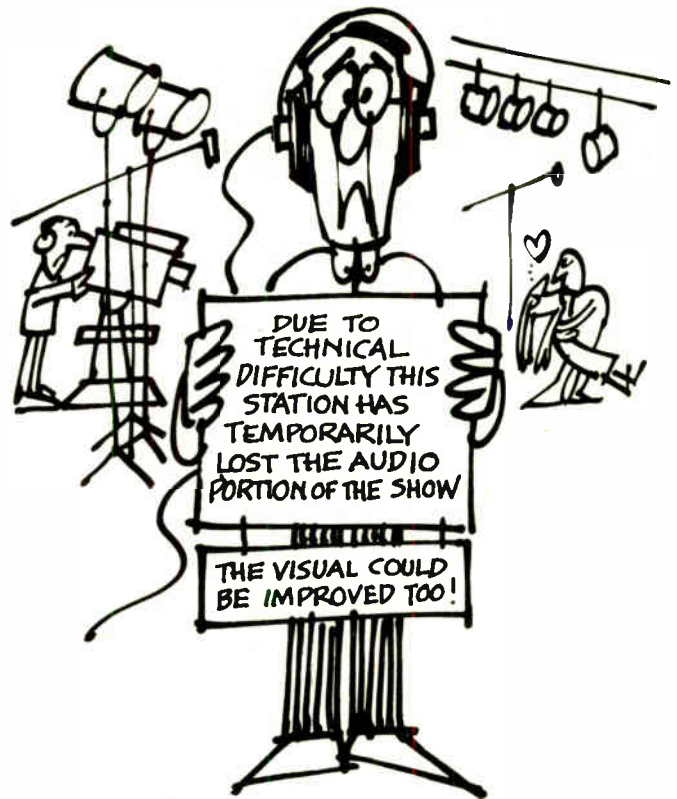
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# Spotmaster



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**MODEL 500BR (RECORDER/REPRODUCER)**



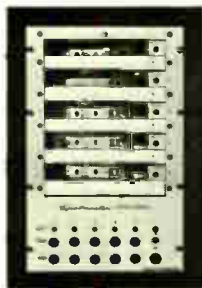
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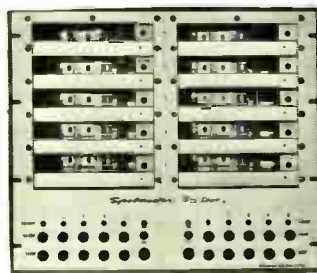
**MODEL 400A  
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**MODEL 500BS — STEREO**



**MODEL 605B  
(REPRODUCER)**



**MODEL 610B  
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**500/505 Super B SPOTMASTER Series 500 Super B** cartridge equipment is unexcelled in performance and long term proven reliability. Available in models to meet every programming need: record/reproduce, reproduce only—compact or rack mounted. Specifications and performance equal or exceed NAB standards. Features include ease of operation, high reliability, solid state plug-in amplifiers, 1, 2 or 3 automatic electronics cueing tones, separate record and play heads, biased cue recording, hysteresis synchronous motor, selective test meter switch, triple zener controlled power supply, transformer output, feather touch illuminated push button switches and a one year parts and labor guarantee. Prices start at **\$510.00**.

**400A/405A SPOTMASTER Series 400** equipment offers traditional SPOTMASTER performance and reliability for the economy minded station. Don't let their low price fool you. New solid state SPOTMASTER compact models are second-best only to the Super B Series. Offered in record-playback (Model 400) and playback-only (Model 405) versions, the compacts permit even the smallest station to enjoy SPOTMASTER pushbutton broadcasting. Compact units carry a 90-day parts and labor guarantee. Many of the features of the Super B equipment are included in the 400 series. Write for complete details. Prices begin at **\$415.00**.

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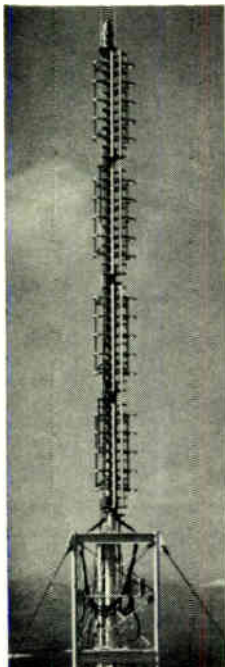
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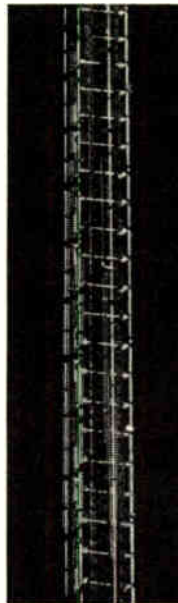
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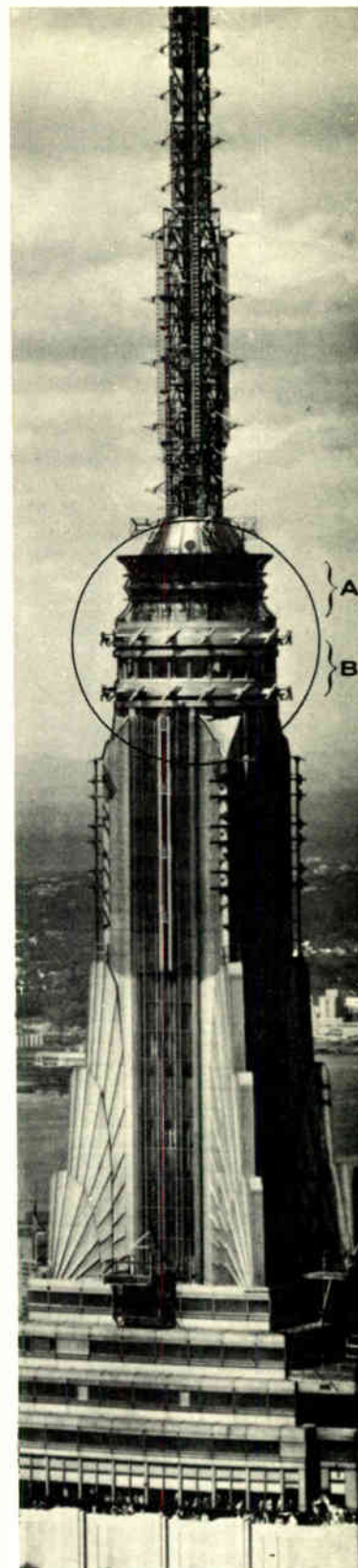
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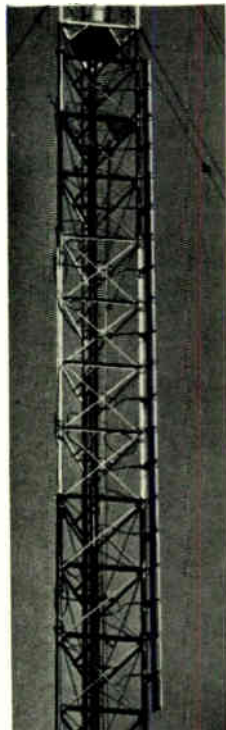
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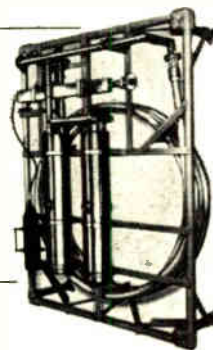
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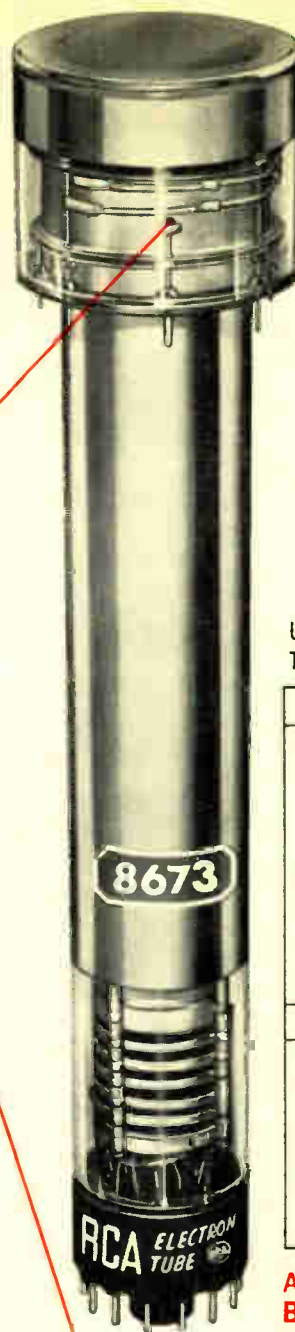
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|---|--------|
| For color pick-up,<br>If you're now using ... You can replace with:         |        |
| 4513/S  | 8673/S |
| 7513/S  |        |
| For black & white pick-up,<br>If you're now using ... You can replace with: |        |
| 4513  |        |
| 7513  |        |
| 7513/L  | 8673   |
| 8093A   |        |
| 8093A/L   |        |
| UNDER LIMITED LIGHTING LEVELS   |        |
| For color pick-up,<br>If you're now using ... You can replace with:         |        |
| 4415S   | 8674S  |
| 4416S   |        |
| For black & white pick-up,<br>If you're now using ... You can replace with: |        |
| 7293A   |        |
| 7293A/L   | 8674   |

**AVAILABLE FROM YOUR RCA BROADCAST TUBE DISTRIBUTOR**

