



## T.R. CELL

A series of medium 'Q', integral cavity T.R. cells for operation in the 'X'-Band. They are designed for coupling to  $\frac{3}{4}$ " i.d. circular waveguide and a preset tuner is incorporated.

QF42A  
to  
QF42K

### PHYSICAL DIMENSIONS.

|                            |     |     |                               |
|----------------------------|-----|-----|-------------------------------|
| Max. overall height        | ... | ... | 3.675ins. (93.35 mm.)         |
| Max. width                 | ... | ... | 2.065ins. (52.4 mm.)          |
| Top Cap (Primer electrode) | ... | ... | CT6 (5BA thread).             |
| Mounting Position          | ... | ... | Any.                          |
| Waveguide                  | ... | ... | Circular $\frac{3}{4}$ " i.d. |

For other dimensions see drawings overleaf.

### FREQUENCY RANGE.

The preset tuner provides tuning over a range of approx.  $\pm 75$  Mc/s.

The operating centre frequency and range is indicated by the suffix letter:—

|       |     |     |                     |
|-------|-----|-----|---------------------|
| QF41A | ... | ... | 9005 to 9155 Mc/s.  |
| QF41B | ... | ... | 9100 to 9250 Mc/s.  |
| QF41C | ... | ... | 9200 to 9350 Mc/s.  |
| QF41D | ... | ... | 9300 to 9450 Mc/s.  |
| QF41E | ... | ... | 9400 to 9550 Mc/s.  |
| QF41F | ... | ... | 9500 to 9650 Mc/s.  |
| QF41G | ... | ... | 9600 to 9750 Mc/s.  |
| QF41H | ... | ... | 9700 to 9850 Mc/s.  |
| QF41J | ... | ... | 9800 to 9950 Mc/s.  |
| QF41K | ... | ... | 9900 to 10050 Mc/s. |

### RATINGS.

|                              |     |              |
|------------------------------|-----|--------------|
| Max. Transmitter Power level | ... | 50 kW. Peak. |
| *Max. Primer Supply Voltage  | ... | -1500 volts. |
| *Min. Primer Supply Voltage  | ... | -700 volts.  |
| *Max. Primer Current         | ... | 200 $\mu$ A. |
| *Min. Primer Current         | ... | 100 $\mu$ A. |

### CHARACTERISTICS.

|                               | Average. | Limit.                    |
|-------------------------------|----------|---------------------------|
| Low Power Level               |          |                           |
| Q <sub>L</sub> ...            | ...      | 160 approx.               |
| V.S.W.R. (at Resonance) ...   | 1.1      | 1.4                       |
| †Insertion Loss ...           | 0.8      | 1.2 dB.                   |
| High Power Level.             |          |                           |
| ‡Leakage at 40 kW.:—          |          |                           |
| Flat Leakage Power ...        | 20       | 30 mW.                    |
| Spike Leakage Energy ...      | 0.06     | 0.1 ergs/pulse            |
| Breakdown Power ...           | 100      | 250 mW.                   |
| Recovery Time (to -6dB.)...   | 1.5      | 4 $\mu$ Sec.              |
| §Position of V.S.W. minimum:— |          |                           |
| Gap discharge ...             | ...      | 0.69" $\pm$ 0.03".        |
| Window discharge ...          | ...      | 0.67" $\pm$ 0.03".        |
| Primer Operating Voltage ...  | 350      | 250<br>to<br>450 } volts. |

\*See note (4) under 'Operating Notes' overleaf.

†Primer energised.

‡1  $\mu$ sec. pulses.

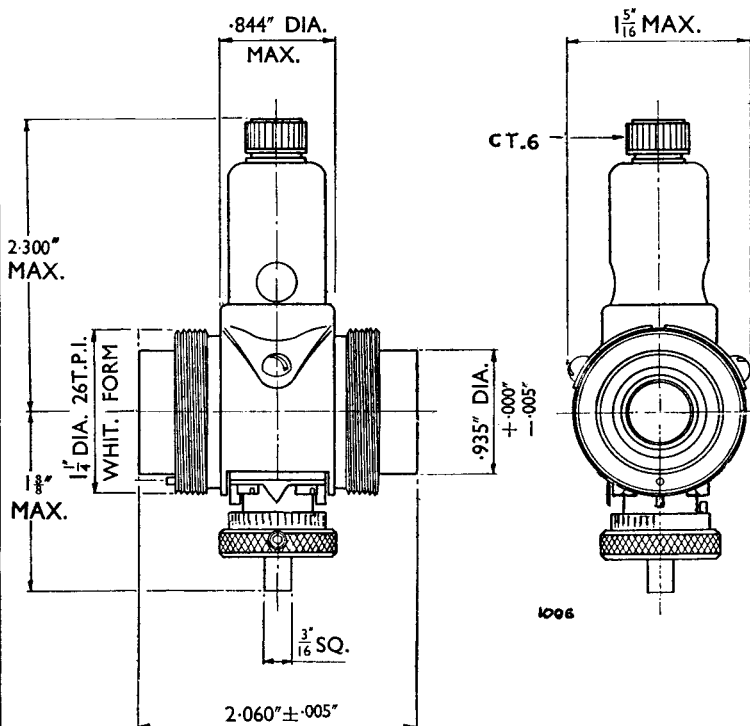
§Measured from the input edge of the cell.

See note (5) under 'Operating Notes' overleaf.

Ferranti

**QF42A  
to  
QF42K**

**Ferranti**



#### OPERATING NOTES.

(1) This T.R. Cell in a simple duplexer, gives complete protection to all types of crystals both from the local and neighbouring transmitters, with an appreciable margin of safety and long life.

(2) A balanced mixer is an advantage.

(3) To give protection from neighbouring transmitters when the set is not operating and the primer unenergised a suitable gate or crystal shutter must be fitted.

(4) To ensure rapid breakdown a negative voltage of 1000V. D.C. should be applied to the primer electrode. The primer current should be restricted to between 100  $\mu$ A and 200  $\mu$ A by means of a suitable limiting resistance. Some of this resistance may be located in the power supply but at least 1 megohm should be connected directly on to the primer terminal to prevent relaxation oscillations. It is advisable to arrange that the keep-alive current is passing for a few seconds before the transmitter begins to operate.

(5) The position of the V.S.W. minimum has two alternative values, depending on whether a window discharge occurs or not, but in either case the crystal protection is not affected. Transition of the V.S.W. minimum from the cones to the window takes place under the following conditions:—

At 8.7 kW, approx. with a pulse width of 1  $\mu$ sec. and a P.R.F. of 1000.

At 10.4 kW, approx. with a pulse width of 1  $\mu$ sec. and a P.R.F. of 500.

At 17 kW, approx with a pulse width of 0.1  $\mu$ sec. and a P.R.F. of 1000.