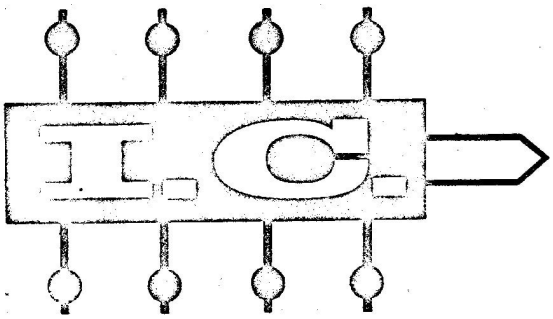

OF THE MONTH

L.A.J. IRELAND

Number 6 — The Sanken SI-1020A/50A Audio Amplifiers

JAPANESE electronic firms have always been quick to follow on the heels of their American and European counterparts and the same trend is becoming evident in the world of microcircuits. Lately the Sanken Electric Co. of Tokyo has introduced two rather advanced hybrid i.c.'s one of which can give an audio output power in excess of 50 watts. A very attractive feature of the units is that they comprise virtually the complete amplifier, the only external components required being a power supply, loudspeaker of 8Ω impedance and coupling capacitor. They provide therefore an ideal beginners project in electronics since with so few components involved, success is virtually guaranteed and a first-class hi-fi amplifier obtained.

A look at Fig. 1 shows that the amplifier itself is fairly orthodox and straight forward in design. The common emitter input stage Tr1, provides a typical input impedance of 70kΩ and degeneration from the output can be applied across its emitter resistor via pin 3 of the i.c. The signal is then r.c. coupled to Tr2 which acts as a driver for the complementary pair Tr3 and Tr4 and these in turn are direct coupled to the power output stage. Provision is made for the inclusion of a ripple filtering circuit in the 1050A version which is not included in the 1020A.

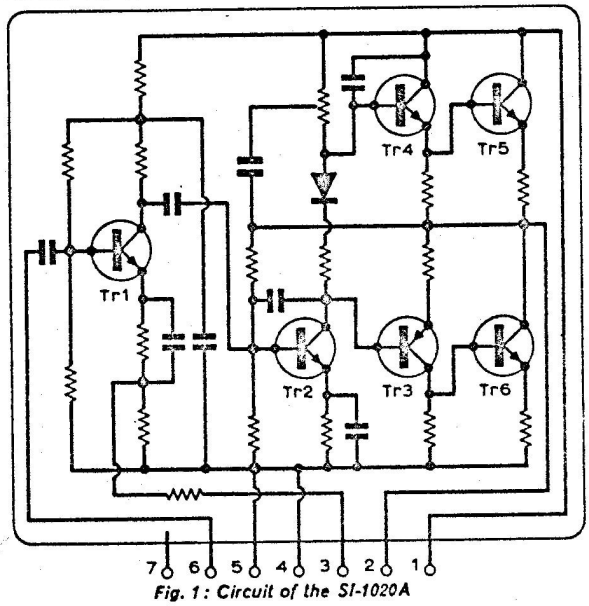

Fig. 1: Circuit of the SI-1020A

Characteristic	Symbol	SI-1020A	SI-1050A
Supply Voltage	V_{cc}	48V	62V
Maximum Continuous Output Power (distortion <0·5%)	P_o max (rms)	25W	50W
Voltage Gain	G_v	30dB typ.	30dB typ.
Frequency Range (output 1W)		20Hz—100kHz	20Hz—100kHz
Input Impedance	Z_{in}	70kΩ typ.	70kΩ typ.
Output Impedance	Z_{out}	0·2Ω typ.	0·2Ω typ.
S/N Ratio		90dB typ.	90dB typ.
Idling Current		30mA typ.	30mA typ.
CONDITION : 25°C ambient, 1kHz, R_L=8Ω			

Electrical characteristics of the two amplifiers

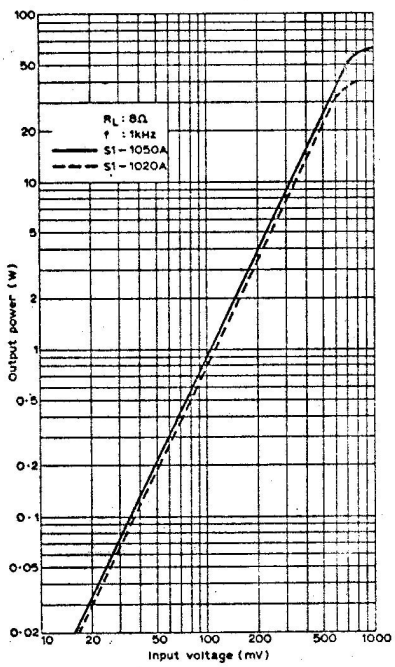

Fig. 2: Graph showing required signal input for a given power output.

A diagram of the complete amplifier together with a suitable power supply is given in Fig. 3. The 1A fuse (2A in the case of the 1050A model) in series with the power supply provides adequate protection in the event of a short-circuit of the loudspeaker terminals. The units themselves are capable of withstanding a short-circuit of the output terminals for 5 seconds under all operating conditions and so the fuse will blow before any damage is done. The metal housing in which the amplifier is mounted provides sufficient heat dissipation and in addition it can be directly bolted to the chassis or case without the need for insulating washers as it is electrically insulated from the i.c. itself. The 1020A measures approx. 3·15in.×1·8in. and the 1050A 3·9in.×1·6in. approx. overall.

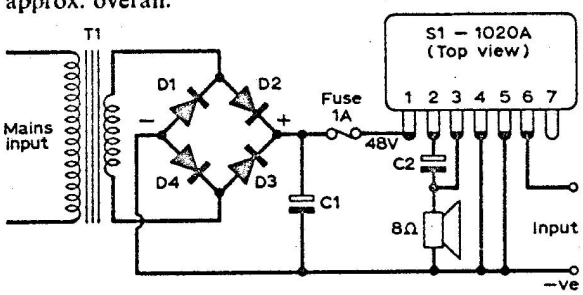

Fig. 3: Circuit of suitable power supply

Two very attractive features of the units are their frequency response, 20Hz. to 30kHz., and harmonic distortion of less than 0·5% at the full output power levels and with a signal to noise ratio of greater than 90dB. they should fill the requirements of the most discerning hi-fi enthusiast. One slight disadvantage however, especially if the units are to be put to mobile use is the rather high operating voltage required but even here idling current has been reduced to a mere 30mA which ensures economical battery operation.

★ components list

Capacitors :

C1 4000μF 60V (70V for 1050A)
C2 2000μF 30V (40V for 1050A)

Miscellaneous :

D1-4 60V 1A (70V 2A for 1050A)
(Henry's Radio Type RS32AF)
T1 Transformer (Henry's Radio Type MT104AT)
IC Type SI-1020A or SI-1050A
(Photain Controls Ltd., Randalls Road, Leatherhead, Surrey)

The signal input levels required for various power outputs can be derived from Fig. 2.

At the present state of the art, these are the most powerful i.c.'s available and provide the obvious answer to anyone requiring a rugged and miniature audio power amplifier.

NEXT MONTH: The RCA 3052 i.c., comprising four separate amplifiers, will be reviewed. It is ideal for use ahead of the SI-1020A or SI-1050A amplifier reviewed above. ◘

THE MW COLUMN

CONDITIONS on the band this winter have been the best for several years. Especially noticeable were the number of Far East stations logged in the afternoons—China on 940, 1000, 1230 and 1290kHz, Taiwan on 750 and 1200, Ryukyu islands on 1178 and 1360, South Korea on 1190. Calcutta 1130kHz was a regular for several weeks. Near East stations logged were Bagdad 760, Teheran 895 and 1325, Kabul 1280, Kuwait 1345 and at night the Indians—Rajkot 1070 and Jabalpur 1180. North American DX was almost unbroken all winter. The writer started the year with a fine logging of *KOMO Seattle* on 1000kHz from 0740 to 0800 Hrs GMT on the 2nd January. Earlier the same morning *WVOV Huntsville Alabama* on the same frequency was heard doing an equipment test at 0630. Other DX includes *CBF Montreal* 690kHz, a Newfoundland relay station on 740, *WJR Detroit* 760, *WWL New Orleans* on 870, *CBM Montreal* 940, *WCFL Chicago* 1000, *CFRB* 1010 in Toronto, *KMOX St. Louis* on 1120, *WBT Charlotte North Carolina* 1110, *WOAI* 1200 in *San Antonio Texas*. Some of the best North American DX occurs in the spring and autumn. Stations that have been logged in this country are *KOMO* 1000kHz in *Seattle, KING* 1090 also in *Seattle, KNX* 1070 *Los Angeles, KEX* 1190 *Portland Oregon, KFBK* 1530 in *Sacramento, California*.

The Caribbean area is often heard well at this time of year. After midnight, look for *CMGN* 720kHz *Radio Rebelde* in Colon, Cuba, *St. Vincent* in the Windward Islands on 705, *Port Maria, Jamaica*, on 750 with the call *JBC, ZFY Radio Demerara, Georgetown, Guyana*, 760, *ZBVI Roadtown, Tortola, British Virgin Islands* on 780, *PJB Trans World Radio Bonaire Netherlands Antilles* on 800 (an easy one), *4VEC 'La Voix Evangelique'* 830kHz *Cap Haitien, Haiti* in French and English, *Radio Belize, British Honduras* on 834, *Radio Caribbean* 840 *Castries, St. Lucia* in English and French, *Radio Antilles* 930 in Montserrat, *Leeward Islands* in French and English, *TIFC 'The Lighthouse of the Caribbean'* 1075kHz in Spanish and English, *WBMJ* 1190kHz in *San Juan Puerto Rico* with pop music and English announcements, *PJD2 'The Gospel Voice of the Eastern Caribbean'* 1295kHz in *St. Maartin, Netherlands Antilles* in Dutch and English. A new station is *Radio Anguilla* on 1505kHz with a power of 500 watts.

The new 1000kW station at *Beida, Libya*, is now on the air on 1124kHz and has been heard in North America. Another powerful North African is *Azilal Morocco* on 209kHz on the Long Waves. This station is the only African on this band and it can be heard in Spanish, French and English as well as in Arabic. The Spanish station audible at sunset on 1140 is ECS11 *Radio Centro Madrid* which has moved from 1394kHz. Another member of the same network is ECS13, *La Voz de Ciudad Real*, currently on 1145kHz.

CHARLES MOLLOY